Pacific Salmon Commission

2002/2003 Eighteenth Annual Report

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Pacific Salmon Commission

Established by Treaty between Canada and the United States March 18, 1985 for the conservation, management and optimum production of Pacific salmon

Eighteenth Annual Report 2002/2003

Vancouver, B.C.
Canada

February 2004

PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY BETWEEN CANADA
AND THE UNITED STATES OF AMERICA
MARCH 18, 1985

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Letter of Transmittal

In compliance with Article II, Paragraph 14 of the Treaty between the Government of Canada and the Government of the United States of America concerning Pacific salmon, it is my pleasure as Chair of the Pacific Salmon Commission to present my compliments to the Parties and to transmit herewith the Eighteenth Annual Report of the Commission.

This report summarizes the activities of the Commission for the fiscal year April 1, 2002 to March 31, 2003.

On June 3, 1999 the Parties signed a comprehensive long-term agreement under the Pacific Salmon Treaty. The agreement established abundance-based fishery regimes for the major interception fisheries in the United States and Canada. The arrangements are all for ten years, except those for Fraser River sockeye and pink salmon, which are for 12 years. The agreement also established two bilaterally-managed regional funds, and included provisions to enhance bilateral cooperation, improve the scientific bases for salmon management and apply institutional changes to the Pacific Salmon Treaty.

A summary of the agreement is available on the PSC website: www.psc.org.

On December 4, 2002, the Parties signed an international agreement detailing a cooperative approach to conservation of salmon stocks originating in the Yukon River in Canada. The agreement will be included as an annex of the Pacific Salmon Treaty. As such, the Yukon River Salmon Agreement is separate from the Pacific Salmon Treaty because it sets out a distinct regime for Yukon River salmon, while adhering to the broad science-based management principles of the Pacific Salmon Treaty.

Reports on the results of the 2002 fishing season presented by the Parties and on meetings of the Commission, the Standing Committee on Finance and Administration and the Northern and Southern Fund Committee are presented in summary. Executive summaries of documents prepared by Pacific Salmon Commission staff and the joint technical committees during the period covered by this report are also presented.

The Auditors' report on financial activities of the Commission during the fiscal year April 1, 2002 to March 31, 2003, as approved by the Commission, is also included in this report.

Yours truly,

Dr. John Davis
Chair

PACIFIC SALMON COMMISSION

OFFICERS for 2002/2003

Chair	Dr. John Davis
Vice-Chair	Mr. Ron Allen

COMMISSIONERS

Canada	United States
Mr. Ron Fowler	Mr. Larry Rutter
Mr. Hubert Haldane	Mr. Kevin Duffy
Mr. Gerry Kristianson	Mr. Rollie Rousseau
Mr. Rich Chapple	Mr. Donald Sampson
Mr. Garnet Jones	Mr. Jev Shelton
Mr. Russ Jones	Mr. David Balton
	Mr. Curt Smitch

SECRETARIAT STAFF

Executive Secretary	Mr. Don Kowal
Administrative Officer	Mr. Ken Medlock
Chief Biologist	Mr. Mike Lapointe

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INTRODUCTION

Interception of Pacific salmon bound for rivers of one country in fisheries of the other has been the subject of discussion between the Governments of Canada and the United States of America since the early part of this century. Intercepting fisheries were identified through research conducted by the two countries on species and stocks originating from Alaska, British Columbia, Washington, Oregon and Idaho. The results of this research identified that Alaskan fishers were catching salmon bound for British Columbia, Idaho, Oregon and Washington. Canadian fishers off the West Coast of Vancouver Island were capturing salmon bound for rivers of Washington and Oregon. Fishers in northern British Columbia were intercepting salmon returning to Alaska, Washington, Oregon and Idaho, and United States fishers were catching Fraser River salmon as they traveled through the Strait of Juan de Fuca and the San Juan Islands towards the Fraser River.

Management of stocks subject to interception became a matter of common concern to both Canada and the United States. A mechanism to enable the countries to reap the benefits of their respective management and enhancement efforts was required. That mechanism is now provided through the Pacific Salmon Treaty, which entered into force upon the exchange of instruments of ratification by the President of the United States of America and the Prime Minister of Canada on March 18, 1985.

The Pacific Salmon Commission, guided by principles and provisions of the Treaty, establishes general fishery management regimes for international conservation and harvest sharing of intermingling salmon stocks. Each country retains jurisdictional management authority but must manage its fisheries in a manner consistent with the provisions of the Treaty. Implementation of the principles of the Treaty should enable the United States and Canada, through better conservation and enhancement, to prevent overfishing, increase production of salmon, and ensure that each country receives benefits equivalent to its own production. The Commission also serves as a forum for consultation between the Parties on their salmonid enhancement operations and research programs.

The organizational structure of the Commission is currently focused on four geographically oriented panels. The terms of new Treaty arrangements signed by the Parties in June, 1999 provided for the creation of a new Transboundary Panel. The Transboundary Panel's stocks of concern originate from the Alsek, Stikine and Taku River systems. The Northern Panel's stocks of concern are those which originate in rivers situated between Cape Suckling in Alaska and Cape Caution in British Columbia. The Southern Panel's stocks of concern are those which originate in rivers located south of Cape Caution, other than Fraser River sockeye and pink salmon. The Fraser River Panel has special regulatory responsibilities for stocks of sockeye and pink salmon originating from the Fraser River.

The functions of panels are to review annual post-season reports, annual pre-season fishing plans and ongoing and planned salmonid enhancement programs of each country, and to provide recommendations to the Commission for development of annual fishery regimes in accordance with the objectives of the Treaty. These plans, once adopted by the Commission and the governments, are implemented by the management agencies in each country.

The Fraser River Panel, in addition, has been accorded special responsibility for in-season regulation of Fraser River sockeye and pink fisheries of Canada and the United States in southern British Columbia and northern Puget Sound, in an area designated as Fraser River Panel Area Waters. Scientific and technical work is conducted for the Panel by the Fishery Management Division of the Commission's Secretariat staff.

Negotiations designed to lead to agreed fishery regimes were conducted at the government-to-government level commencing in the spring of 1998. A comprehensive agreement was reached by the Parties on June 30, 1999.

As a result of the agreement, long-term fishing arrangements are in place for ten years, except for Fraser River sockeye and pink salmon, which is a 12-year arrangement.

With fishery arrangements in place, the meeting agendas for the Commission have concentrated on implementation of the elements of the new arrangements that will improve fisheries management and aid the countries efforts to recover weakened stocks. These provisions include establishment of two bilaterally-managed restoration and enhancement funds, provisions to enhance bilateral cooperation, improvements to the scientific basis for salmon management and application of institutional changes to the Pacific Salmon Commission.

On December 4, 2002, the Parties signed an international agreement detailing a cooperative approach to conservation of salmon stocks originating in the Yukon River in Canada. The agreement will be included as an Annex of the Pacific Salmon Treaty. As such, the Yukon River Salmon Agreement is separate from the Pacific Salmon Treaty because it sets out a distinct regime for Yukon River salmon, while adhering to the broad science-based management principles of the Pacific Salmon Treaty.

The Commission meets at least once annually and conducts its business between meetings through its permanent Secretariat located in Vancouver, British Columbia. In the period April 1, 2002 to March 31, 2003, the Commission met on five occasions:

1. Commission Extraordinary Executive Session
   April 22-23, 2002 – Vancouver, B.C.

2. Commission Extraordinary Executive Session
   June 11-12, 2002 – Vancouver, B.C.

3. Commission Executive Session
   October 22-24, 2002 – Kamloops, B.C.

4. Post-Season Meeting of the Commission and Panels
   January 13-17, 2003 – Vancouver, B.C.

5. Eighteenth Annual Meeting of the Commission
   February 10-14, 2003 – Portland, Oregon

This, the Eighteenth Annual Report of the Pacific Salmon Commission, provides a synopsis of the activities of the Commission and its subsidiary bodies during its Eighteenth fiscal year of operation, April 1, 2002 to March 31, 2003.

Activities of the Commission

PART I
ACTIVITIES OF THE COMMISSION

A. EXTRAORDINARY SESSION OF THE PACIFIC SALMON COMMISSION
April 22-23, 2002 – Vancouver, B.C.

The Commission held the extraordinary meeting in order to deal with three topics surrounding Fraser River salmon; the 2000 and 2001 calculation of the TAC, a proposal made by the U.S. Section to revise the Fraser River Panel process, and the Late-run sockeye study plan.

The U.S. Section gave an overview of its proposal regarding Fraser River sockeye and pink salmon management. The proposal centered upon the calculation of the TAC and on how in-season decisions would be made in the future. The U.S. proposal included the revision of the Fraser River Annex.

The Commission discussed the proposal. Canada had concerns about its scope and breadth and required more time to better understand its implications.

After extensive discussion and several caucuses, the Commission agreed to form a bilateral group that would examine both the U.S. proposal and Canada's views. Canada asked the U.S. to prepare a draft paper that would indicate which parts of the Annex the U.S. wanted to change and which parts would remain the same. The paper would also include the U.S.'s proposal on the TAC calculation for 2000 and 2001. The group would carry out its work over the following month. The Commission hoped to come to a resolution on the issues at an extraordinary bilateral meeting to be held in Vancouver in the beginning of June, 2002.

The third subject surrounding the Fraser River discussed by the Commission was the plan developed by the Committee on Scientific Cooperation to study the late-run sockeye salmon problem.

Dr. Laura Richards and Mr. Steve Pennoyer of the Committee, and Mr. Al Cass of Canada Fisheries and Oceans appeared before the Commission to present the "Research proposal for Late-run Fraser sockeye to assess conservation and management issues related to early river entry and high in-river mortality." The proposal included sections on the objectives of the proposed studies, design options for achieving the objectives, a description of marine radio tagging methods and of freshwater conventional tagging methods, a summary of the tagging design proposal, other research proposals and the total cost for proposed late run studies in 2002.

The Commission discussed the proposal and the funding that would be necessary to carry out the studies.

B. EXTRAORDINARY SESSION OF THE PACIFIC SALMON COMMISSION June 11-12, 2002, Vancouver, B.C.

This extraordinary session of the Commission was held to deal with the unresolved issues surrounding Fraser River salmon. These issues included a disagreement about the calculation of the 2000 and 2001 total allowable catch (TAC) and a proposal to improve the Fraser River Panel process tabled by the U.S. at the Commission's extraordinary April session. At the conclusion of the April session, the Commission had agreed that a bilateral group would be formed to work on the proposal and to report to the Commission at a June meeting.

The U.S. proposal discussed in April manifested itself in a revised Fraser Annex. At the conclusion of the April session, the U.S. Section believed that the Parties had agreed to amend the Annex. However, Canada believed that it had made it clear that it was unprepared to do so. Therefore, Canada developed a proposal that emphasized the procedural aspects of the operation of the Fraser Panel. The Commission would give the Panel instructions about how to implement in-season decision making.

The bilateral group formed at the April session had been working on the Canadian proposal. Progress was made on the process issue and the Parties were close to an agreement. However, the Commission was not close to an agreement on the TAC calculation issue. The U.S. had to decide whether it would accept Canada's proposed approach, or, if it would insist on amending the Annex in order to make changes to the TAC calculation process.

After a number of position papers and proposals were tabled and extensively discussed, the Commission developed and adopted a document titled "Commission Guidance to the Fraser River Panel and PSC Staff".

The document contained guidelines that would move the Commission towards an improved Fraser River Panel process. It included guidance for in-season run-size projections and fishery management recommendations. It set out how the new Fraser River Panel process would be reviewed. The paper also included instructions for the computation of Fraser River sockeye salmon total allowable catch for 2000, 2001 and 2002.

The Chair of the Commission was charged with conveying the terms of the document to the Fraser River Panel and the PSC staff.

C. EXECUTIVE SESSION OF THE PACIFIC SALMON COMMISSION October 23-24, 2002, Kamloops, B.C.

The Commission met twice in Executive Session during this meeting.

Mr. David Balton of the U.S. State Department was introduced as the newly appointed alternate U.S. federal Commissioner.

The Commission reviewed and finalized the terms of reference for the Chinook Interface Group (CIG) which was formed in response to a recommendation made in the February 2001 Applegate report on chinook. The report recommended that the Commission establish a sub-group to help the Chinook Technical Committee (CTC) differentiate

between policy and technical issues. The CIG would liaise with the CTC and bring policy issues to the full Commission for discussion.

The possibility of funding of a position in the PSC Secretariat office charged with handling issues surrounding chinook was discussed. Executive Secretary Kowal recommended that the position be "test-driven" using existing PSC staff resources in an attempt to determine the requirements of such a position.

Dr. Gary Morishima reported on behalf of the Selective Fisheries Evaluation Committee (SFEC). The Committee had developed a protocol to be used for the consideration of Mass Marking and Mark Selective Fisheries proposals. The protocol included templates as well as recommendations about how the templates would be utilized and reviewed. The Commission formally adopted the protocol and directed that the agencies be asked to use the templates for mass marking/selective mark fisheries proposals.

Mr. Pennoyer of the Committee on Scientific Cooperation (CSC) reported on the proposed work plan for late-run Fraser sockeye. Mr. Mike Lapointe of the Pacific Salmon Commission Secretariat gave a presentation about the season's late-run tagging studies and Mr. Ted Perry of Canada Fisheries and Oceans gave a presentation about testing the samples obtained from late-run sockeye for contaminants and parasitology.

Mr. Perry gave a presentation about Canada's Species at Risk legislation which was expected to become law in June 2003. The presentation included an overview of the Act and an outline of some of the possible impacts that the legislation would have on fisheries management.

Commissioner Davis gave a presentation about the "Status of PSC Funding: Resources and Priorities". The presentation included background on Canada's funding pressures, a description of Canada's resources and obligations and its future funding challenges and priorities.

The Commission reviewed the annual work plans of its Panels and Technical Committees and adopted instructions to the Panels.

D. MEETING OF THE COMMISSION AND PANELS
January 14 - 16, 2003, Vancouver, B.C.

The Commission held four bilateral Executive Sessions during this meeting.

The Commission reviewed the Agreed upon Treaty Commitments Table and the Parties tabled their post-season reports.

Canada gave a presentation about strategic considerations for future program planning. The presentation focused upon some of the future challenges and priorities facing Canada and the United States regarding fisheries management, including budgetary concerns and uncertainties presented by issues such as ocean survival, El Nino and the late-run Fraser River sockeye problem.

The Commission received a briefing on the Yukon Salmon Agreement. On December 4, 2002, the U.S. and Canada exchanged notes concluding an agreement on sharing Canadian origin Yukon River Salmon. It was explained that there is a formal relationship

between the Yukon Agreement and the Pacific Salmon Treaty (PST). The Yukon Annex created a new Panel under Annex I of the Treaty. It also created a new chapter of the Treaty (Chapter 8) under Annex IV. Many of the general provisions of the PST apply to the Yukon Agreement. However, many do not and there is essentially no practical relationship between the implementation of the Yukon Agreement and the work of the Pacific Salmon Commission. The Commission has no legal responsibility for implementing the Yukon Agreement or for overseeing the work of the Yukon Panel. The funding for the Yukon Agreement will not be co-mingled with that of the PSC. The Yukon Panel will not receive any significant administrative support from the PSC Secretariat.

Dr. Karl English of LGL gave a presentation about the 2002 Fraser River Sockeye Telemetry Study. He gave an overview of the objectives of the study, the field methods employed, and a summary of results.

Dr Laura Richards of the Committee on Scientific Cooperation (CSC) gave a presentation about additional studies conducted on Late-run salmon including those that looked at Adams sockeye energy patterns, the maturation state of sockeye at river entry, parasitological analysis and oceanographic studies. Most of the analysis was still in progress and a final report was not yet available.

The Commission discussed and formally adopted the "Technical Dispute Settlement Board: Rules and Procedures". Within a year the Commission would agree upon a roster of ten individuals to be drawn from to sit on a Technical Dispute Settlement Board (TDSB) if a request for dispute settlement is received by one of the Parties.

The Chinook Interface Group (CIG) reported on its activities. The Group had met with the Chinook Technical Committee (CTC) co-chairs who presented a number of policy questions to be decided upon by the Commission. The CIG discussed these questions and proposed to bring forward recommendations to the Commission for its consideration at the February meeting.

The Commission agreed that the Chinook Technical Committee's annual catch and escapement report be completed and available each year for use by the Commission at its annual meeting in February.

The Commission heard a status report from the Northern Panel on the progress made in finalizing overages and underages. The Northern Boundary Technical Committee was assigned to review data that was used in the reconstruction of the Nass and Skeena runs. A draft report had yet to be written and the Technical Committee would not be ready to report to the Panel in time for the February meeting.

The Finance and Administration Committee reported that it had approved the minutes of its December meeting and with that, the Commission's budget for 2003/2004.

Dr. Hargreaves and Dr. Morishima, co-chairs of the Selective Fisheries Evaluation Committee (SFEC), gave a presentation on the Committee's activities. Its main focus had recently been on the evaluation of mass-marking and mass marked selective fishery activities proposed by the U.S. and Canada for 2003.

SFEC was debating if it had asked for the right information from the agencies in order to carry out the necessary analysis of the impact of the fisheries. It was also discussing policy implications that may be faced by the Commission. One policy question that the Committee required guidance from the Commission on was what level of risk posed by Mark Selective Fisheries and Mass Marking was acceptable.

The Commission directed SFEC to prepare a short, focused paper that laid out key policy questions and issues. The Commission would return to the topic in February.

Dr. Morishima reported on behalf of the Coho Technical Committee. 2002 was the first year that the Committee had begun to operate on the implementation of the new agreement for southern coho. It was reviewing a number of issues that might eventually be brought to the Commission table. The Committee hoped to establish a policy/technical workgroup with the participation of the Southern Panel to try to address both the technical and policy aspects of the implementation of the regime.

E. PACIFIC SALMON COMMISSION ANNUAL MEETING
February 10 - 14, 2003, Portland, Oregon

The Commission met four times in Executive Session during this meeting.

The Commission discussed the Fraser River Panel process at two of its bilateral sessions. In 2002 the Commission had agreed that:

"Based on the experience of the 2002 season and subject to a positive review agreeable to both National Sections, the Panel shall make recommendations to the Commission for appropriate changes to Chapter 4 Annex 4 provisions and/or the Fraser Panel guidance provided herein."

The Commission heard that the Panel had met numerous times to discuss how to deal with the 2003 season. It did not want to return to the decision making process used prior to 2002. The Panel agreed that the 2003 process should take into account the importance of a structured Fraser River Panel process where it would receive advice and recommendations from the PSC staff in a bilateral setting. The Panel also agreed that there should be a clear set of guidelines and performance standards developed to discipline or structure its in-season decision making. The Panel wished to continue to "learn by doing" to ensure that it had the flexibility to make corrective changes. Therefore, it did not recommend a change to the Annex for 2003.

The Commission subsequently accepted two documents presented by the Fraser River Panel: "Commission Guidance to the Fraser River Panel and PSC staff for 2003" and "Fraser River Panel Review of Modifications to the 2002 Fraser River Panel Process as Directed by the June 12, 2002 Commission Guidance to the Fraser River Panel and PSC Staff".

The Chinook Interface Group (CIG) reported on its meetings with the co-chairs of the Chinook Technical Committee (CTC). These meetings centered upon the topics of total fishing mortality and escapement goals.

After extensive discussion the following recommendation was adopted by the Commission:

"The CIG recommends that the Commission direct the CTC to provide at least two alternative constructions of Table 1 in nominal fish to represent a total fishing mortality framework for the AABM fisheries, including alternatives to address implementation of simplified total mortality regimes for sub-legals. The alternatives should, at minimum, present methods for relating sub-legal chinook fishing mortalities to landed catch equivalents."

Extensive discussions were held by the Commission about issues surrounding mark selective fisheries (MSF) and mass marking (MM).

Dr. Hargreaves and Dr. Morishima appeared before the Commission on behalf of the Selective Fisheries Evaluation Committee (SFEC). They reported that SFEC had not completed its formal report. There were many complex issues embedded in MSF's and MM and trying to understand these issues had occupied much of the Committee's time.

The Commission discussed several aspects of the selective fisheries issue including the enormous policy implications involved. These policy implications included the impacts that MSF's would have on things such as the viability of the CWT system, on the raising of hatchery fish, and on the ability to assess the impacts of the Commission's activities as well as the level of risk that the Commission was willing to accept regarding these impacts. The focus of SFEC's activities and the best use of its efforts were also debated.

The Commission's directed SFEC to complete its report on its activities. The report was to include suggestions to the agencies on monitoring requirements for MSF's and a clear elaboration about what role SFEC might play in the future.

Commissioner Rutter agreed to work on a white paper about the larger picture facing the Commission in the area of MSF's and MM. The paper would include, as an example, ideas about future directions, about where the Commission was heading with MSF's and MM as well as with other technologies, what transitions might be necessary, and the impacts on the CWT system. It was suggested that a small work group be formed to write the paper and that a draft be distributed before the October meeting so that the Commission could move quickly to the next step.

The Commission accepted the report of the Finance and Administration (F&A) Committee. In the report, the Committee put forth several recommendations including the acceptance of a budget for fiscal year 2003/2004 and the Commission's proposed meeting schedule.

Mr. Angus MacKay, Endowment Fund Coordinator, presented the Annual Report of the Southern and Northern Restoration and Enhancement Funds.

Mr. Steve Pennoyer and Dr. Laura Richards presented the report of the Committee on Scientific Cooperation.

Executive Secretary Kowal was instructed to develop an orientation session for new members of PSC Panels and Committees. The orientation would be presented on the first day of each annual meeting and would familiarize new members with the PSC process, protocols and rules. The National Correspondents would assist by offering orientation sessions to new members about how their respective Sections operate.

It was noted that in January, Canada had expressed concerns about overages and underages in the northern boundary area. Canada wished to note that an agreement was reached at the January Commission meeting on the run reconstruction for the years 1982 – 2001. A final report being prepared by consultants would be available in March, 2003 and other work was ongoing in this area of concern.

Activities of the Standing Committees

PART II
ACTIVITIES OF THE STANDING COMMITTEES

A. MEETINGS OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

1. Committee Activities

The Committee met on December 11, 2002 and January 16, 2003 in Vancouver, BC to consider a range of financial and administrative issues. The Committee's deliberations focused primarily on a review of the Commission's current budget proposals for FY 2003/2004 and a budget forecast for FY 2004/2005 and beyond.

The Committee approved, subject to funding approval by the Parties, the Commission budget at the contribution level of CS1,506,442 per party (Appendix C) with total expenditures of C$3,105,202. This represents an increased contribution per party over last year of C$159,704. The Committee **recommended** acceptance of the budget. The new budget does not provide for any additional programs in 2003/2004.

The Committee reviewed the revolving test-fishing fund and established a cap for this fund at C$500,000.

The Committee also reviewed staff projections of expenditures for the balance of the current fiscal year. The staff reported a forecast carryover of CS77,317 to next year. It was **recommended** that the CS77,317 carryover from 2002/2003 be carried to fiscal 2003/2004 to offset costs of programs initiated in that fiscal year.

The Executive Secretary previewed the projected budgets for 2004/2005 and 2005/2006.

The Committee approved a meeting schedule which proposed that the Executive Session for October 19-21, 2004 would be held in Victoria, BC. The Executive Session for 2005 would be held October 18-20 at a location in Alaska, possibly Sitka.

The Committee reviewed the Secretariat's technology needs. The Committee expressed concern that the Secretariat had been delaying needed capital item replacement in order to balance annual budgets. It was recommended and approved that the Secretariat be authorized to spend CS35,000 from the Working Capital Fund on the highest priority technology needs.

The Committee also reported that Secretariat staff will work with the Chinook Interface Committee and the CTC. The Secretariat will report on the nature of the activities and as to whether the needs warrant a full time staff position.

Mr. Steve Pennoyer from the Committee on Scientific Cooperation reported on the estimated costs for continued studies on the Early Arrival of Late Run Sockeye. The cost for continuing studies was estimated to be CS450- S500,000

2. Secretariat Staffing Activities

A list of Secretariat staff employees as of March 31, 2003 is presented in Appendix D.

An updated membership list for panels, standing committees, joint technical committees and ad hoc working groups as of March 31, 2003 is presented in Appendix H.

B. MEETINGS OF THE STANDING COMMITTEE ON SCIENTIFIC COOPERATION

The Committee on Scientific Cooperation (CSC) continued its involvement in the study of the early entry of late-run Fraser River sockeye. Members of the Committee attended the Extraordinary Session of the Pacific Salmon Commission held in Vancouver on April 22 and 23, 2002. At that meeting the CSC presented a research proposal for late-run Fraser sockeye aimed at assessing conservation and management issues related to early river entry and high in-river mortality. Fisheries and Oceans Canada would oversee the proposed study.

A tagging and sampling study of late-run Fraser River sockeye was carried out in 2002. At the Commission's October 2002 Executive Session held in Kamloops, B.C. the Committee reported that it planned to attend a workshop in December during which questions arising from the 2002 study would be examined and suggestions for future steps would be discussed.

At the January 2003 Commission meeting held in Vancouver, B.C. the CSC gave an overview of the 2002 biological sampling program on Fraser River sockeye. A summary of the other studies carried out was given, including those that looked at Adams sockeye energy patterns, the maturation state of sockeye at River entry, parasitological analysis, and oceanographic studies. Most of the analysis was in progress. The CSC planned to consult with the Fraser Panel about possible next steps.

At the Commission's Annual Meeting held in Portland, Oregon in February 2003 the CSC reported that Canada Fisheries and Oceans had compiled a list of possible research options for 2003 to follow up on the 2002 Fraser River sockeye studies. The CSC believed that the marine tagging program should be continued in 2003. The Committee also proposed a continuation of the analysis of the samples taken in 2002 and for the analysis of samples that would be taken in 2003. The CSC hoped to convene a project team to review the final results of the 2002 studies.

C. MEETINGS OF THE NORTHERN AND SOUTHERN FUND COMMITTEES

The Northern and Southern Fund Committees have agreed that given the congruent nature of their agendas, their decision to combine the funds into a single master account for investment management purposes, and the efficiencies involved with respect to interaction with the fund managers, it was appropriate to meet together as a Joint Fund Committee at least until such time as the two committees begin to fund projects in their respective areas. Thus the Joint Fund Committee met in person on two occasions (June 2, 2003 and November 4-5, 2003) and by telephone conference call three times (March 14, 2003, May 5, 2003 and September 12, 2003), and once in a combined in-person and conference call arrangement (February 14, 2003). In addition, a four person Global Value Manager Search

Sub-Committee met once in person (January 13, 2003) and once via conference call (March 6, 2003).

The Joint Committee's first meeting in 2003, a combination conference call and in person meeting, was held in Portland, Oregon on February 14th, 2003. Perry Teperson of Hewitt and Associates provided an assessment of a reply to a letter sent to the Funds' US equity managers MFS Investment Management (MFS) in December, 2002 regarding access to a pooled fund investment vehicle so as to reduce the high fees currently paid to MFS by the Fund. It was agreed to respond to MFS expressing dissatisfaction with their reply. A report was given on progress in the search for a Global Value Manager and the search sub-committee agreed to meet again for further discussion.

The second meeting of the year was held via conference call on March 14th, 2003. The Global Value Manager search sub-committee recommended that Brandes Investment Partners be chosen and a motion was passed confirming the selection. A draft letter to MFS was reviewed and changes suggested. Hewitt and Associates were instructed to prepare suggestions of alternate investment management firms.

A dollar cost averaging strategy was discussed as a possible strategy for the anticipated last US funded installment into the Fund.

The third meeting of the year was held via conference call on May 5th, 2003. The dollar cost averaging strategy was further debated with the general consensus being that a 6 month phase-in period with Brandes would be suitably conservative and risk averse given the prevailing market conditions. A motion to this effect was passed unanimously. Hewitt and Associates agreed to prepare a discussion document suggesting alternative investment management firms to MFS for consideration at the next meeting.

The fourth meeting of the year was an in person meeting held on June 2nd, 2003. There was a brief discussion on the operating budget. Hewitt and Associates presented their first quarter report, in which the Fund returned a disappointing –8.3% and some attention was paid to the influence on the Fund of the strong Canadian dollar. On the subject of MFS, Hewitts' recommendation was to not fire the firm because they were performing acceptably in a difficult market environment and an adequate period of time had not elapsed in order to afford a fair evaluation of the manager's performance. A majority of the Committee agreed with this analysis. A debate on active and passive Bond manager alternatives followed. The meeting closed with a review of a spreadsheet model forecasting potential funding scenarios under a variety of different financial assumptions.

At the fifth meeting held by telephone conference call on September 12th, 2003, Hewitt and Associates presented their second quarter report, noting that equities had rallied during the quarter and the bond portfolio had performed well. The pro's and con's of the MFS pooled fund option were debated. The active vs. passive bond issue debate was deferred to a later date. Some potential topics for discussion at the upcoming annual Fund Manager reviews in November were discussed.

The last meeting of the year was marked by the annual Fund investment manager performance report and interviews held at the PSC office on November 4th and 5th, 2003. The Committee was generally satisfied with the performance and report from Barclays Global Investors. The interview with Putnam Investments led to a very lengthy debate concerning the company's recent difficulties with U.S. mutual fund regulators. In particular,

the Committees were very concerned about the discoveries of unethical trading activity by both clients and key staff of Putnam. Senior staff changes and uncertainty about the potential impacts on future returns that might result for existing and prospective investors created by Putnam's improprieties were also a significant concern. Since the situation with Putnam had only come to light just prior to the meeting and it appeared that steps were being taken by the company to rectify the situation, a decision was made to retain Putnam for the moment and to request additional information for consideration by the Committees in January. The Committees were satisfied with the report and performance of Brandes Investment Partners. The interview with MFS also triggered vigorous debate, but this time concerning the company's performance, the outcome of which was a decision to retain the firm and re-evaluate in November 2004. In the meantime staff were instructed to initiate a transfer of assets from the MFS segregated account into an available pooled fund, to benefit from a saving in management fees.

It should be noted that due to the status of the Funds' investments, no discussion was held related to fund expenditures in support of restoration and enhancement activities.

Activities of the Panels

PART III
ACTIVITIES OF THE PANELS

A. FRASER RIVER PANEL

The Fraser River Panel completed the 2002 fishery management plan for Fraser River sockeye salmon in Panel Area waters on June 20, 2002. The Panel carried out its in-season fishery management responsibilities as per Annex IV, Chapter 4. Commission staff conducted its regular in-season assessment programs and reported results to the Panel.

The Panel met in bilateral session during the January and February 2003 meetings of the Commission to review the results of the 2002 fishing season, to receive reports from Canada on spawning escapements and to discuss issues of concern for the 2003 fishing season. Commission staff reviewed the concerns regarding the potential for continued early upstream migration behaviour of Late-run sockeye and identified specific areas of fishery impacts.

B. NORTHERN PANEL

The Bilateral Northern Boundary Panel met in January, 2003. During this post-season meeting, the Panel received post fishery reports for the Northern Boundary area fisheries from the fishery managers of both parties, as well as a presentation by DFO personnel on the sockeye salmon forecasts for 2003 for the Nass and Skeena Rivers. A report by the Northern Boundary Technical Committee on run reconstruction methods and data review, including the status of current overages and underages, was postponed to the January, 2004 session. A discussion was conducted on when to finalize the numbers for a given year. Treaty language says "Jan 31 of following year unless otherwise agreed to". This issue will be pursued further in the 2004 session.

C. SOUTHERN PANEL

The Southern Panel met in bilateral session during the January and February 2003 meetings of the Commission. The Panel defined terms of reference for the bilateral Coho Working Group, comprised of Panel members and the Coho Technical Committee (CoTC) co-chairs, to facilitate implementation of the Southern Coho in a timely and efficient manner.

The Southern Panel also discussed management of chum salmon and the need to revise the Chum Annex of the PST, given changes in Canada's management of its chum fisheries and resultant inability to implement current annex provisions. The Panel defined a schedule for negotiating an agreement on management of 2003 chum fisheries, based on joint interests defined by the Panel, with the intention of modifying the existing Chum Annex during the 2004 bilateral sessions.

D. TRANSBOUNDARY PANEL

The Transboundary Panel met in bilateral sessions during the January and February 2003 meetings of the Commission. At the January meeting, the Panel received reports from fishery managers on transboundary river fisheries in 2002 and updates on bilateral sockeye salmon enhancement activities in the Taku and Stikine rivers from the Enhancement Subcommittee of Transboundary Technical Committee. During the two meetings position papers were exchanged on implementing new directed fisheries on Taku River chinook salmon and developing abundance-based management regimes for transboundary river chinook salmon, and the Panel discussed at length issues relevant to the proposals. The Panel also discussed the status of the enhancement programs on the rivers, and issues related to poorer than expected returns from the Taku River program and management complications with the Stikine River program. The Panel assigned the Transboundary Technical Committee to develop technical information on options for implementation of directed fisheries on Taku River chinook salmon, and the Enhancement Subcommittee to assess additional enhancement opportunities in the Taku River drainage.

E. YUKON PANEL

Over the past Fiscal Year, the Yukon River Panel met the weeks of November 18, 2002 and March 10, 2003.

The primary purpose of the fall 2002 meeting was to conduct a post-season review of 2002 fisheries and to review conceptual proposals submitted for projects to be funded in 2003/2004 under the Yukon Restoration and Enhancement Fund.

Results of the 2002 fishing season can be found in: *Yukon River Joint Technical Committee Report. 2002. Yukon River Salmon Season Review for 2002 and Technical Committee Report* available from DFO Whitehorse or through: Mr. Hugh J. Monaghan, Executive Secretary, Yukon River Panel, Box 20973, Whitehorse, Yukon. Y1A 6P4.

Chinook salmon fisheries were restricted in both Yukon and Alaska because of conservation concerns and major restrictions occurred in commercial fisheries. However, the spawning escapement for upper Yukon chinook salmon was not quite achieved: 21,100 vs a target of 28,000 fish. Preliminary estimated U.S. catch of upper Yukon Canadian –origin chinook salmon was 35,200 fish (94% of the TAC) whereas, the Canadian catch totaled 8,100 chinook salmon (22% of the TAC). Canadian harvest share as specified in the Yukon River Salmon Agreement (YRSA) is 20-26% of the TAC for upper Yukon chinook salmon. The inferred U.S. share is 74-80% of the TAC.

Spawning escapement for upper Yukon chum salmon of 85,700 fish exceeded the minimum escapement target of 60,000 fish. Major restrictions were imposed in both commercial and subsistence fisheries in Alaska and in Canadian commercial fisheries, again because of conservation concerns. The estimated U.S. catch of Canadian-origin upper Yukon chum salmon of 6,300 fish represented about 12% of the TAC. The Canadian catch was similar, 6,300 fish, also representing 12% of the TAC. Canadian harvest share as specified in the YRSA is 29-35% of the TAC for upper Yukon chum salmon. The inferred U.S. share is 65-71% of the TAC.

Although major cutbacks occurred in Canadian and U.S. fisheries targeting Porcupine River stocks, spawning escapement through the Fishing Branch weir was only 13,300 chum salmon. This escapement is far below the rebuilt target of 50,000 to 120,000 chum salmon. No harvest shares for this stock were identified in the YRSA.

Of the 100 conceptual proposals reviewed at the fall meeting, 64 were approved and proponents were subsequently encouraged to proceed with submissions of detailed proposals. Of specific importance, the Panel passed a resolution titled: *Support for the Inter-Agency Radio Telemetry Studies of Yukon River Salmon Stocks.*

In the March 2003 meeting, primary accomplishments included: a review of the run outlooks for 2003 and setting of escapement targets for the upcoming season; an update on Yukon Panel and JTC planning initiatives; and, final approval of R&E projects for 2003/2004.

Run outlooks were prepared by the Yukon River Joint Technical Committee and are presented in their March 15, 2003 report: *Yukon River Salmon Run Outlooks For 2003 And Recommended Escapement Goals, And Selected Project Updates*. This report is available as per the reference to the 2002 season review above.

Generally, run size outlooks for both Canadian-origin upper Yukon chinook and chum salmon are for below average in 2003. The outlook for Fishing Branch chum stock (Porcupine drainage) is for a poor run.

Recommended escapement targets agreed by the Panel for 2003 were:

- >28,000 Canadian origin chinook (>25,000 if U.S. commercial fisheries remain closed);
- >65,000 upper Yukon Canadian origin chum salmon; and,
- >15,000 Fishing Branch chum salmon.

JTC research planning initiatives were reviewed at the Panel meeting and an update can be found in the aforementioned March 15 JTC report. This work in progress is attempting to identify knowledge gaps and prioritise future projects that: a) assess and achieve fishery management objectives; b) assess, conserve and restore salmon habitats; c) build and maintain public support of, and meaningful participation in, salmon resource management; and, d) improve understanding of salmon biology and ecology.

The development of a Yukon Panel R&E plan is a priority of the Panel to provide guidance on future allocations of the Fund. An approach was reviewed by Edwin Blewett and Associates and adopted by the Panel. The first bi-lateral workshop was scheduled May 21-23 in Whitehorse for the R&E plan working committee.

The Panel approved fifty salmon restoration and enhancement projects for $1,128,200US/$1,669,700Cdn for 2003 - eight are in Alaska and forty-two are in Yukon.

Review of 2002 Fisheries and Treaty-Related Performance

PART IV
REVIEW OF 2002 FISHERIES AND TREATY-RELATED PERFORMANCE

The following review has been drawn from a number of reports prepared by Commission staff, joint technical committees, and domestic agencies for presentation to the Commission. Source documents are referenced for each part of this review. All figures are preliminary and will be updated in future reports as more complete tabulations become available.

A. FRASER RIVER SOCKEYE SALMON

In 2002, the Fraser River Panel managed fisheries in the Panel Area that targeted Fraser River sockeye salmon, under the terms of Annex IV of the Pacific Salmon Treaty that was revised on June 30, 1999 (Appendix E). Chapter 4 of the Agreement provided catch sharing arrangements for Fraser River sockeye and pink salmon for the years 1999-2010.

Prior to the fishing season, the Panel recommended a fishery regime and management plan for Panel Area fisheries to the Pacific Salmon Commission. The plan was based on abundance and timing forecasts and escapement targets for Fraser River sockeye salmon provided by Fisheries and Oceans Canada, international allocation goals set in the Agreement, domestic allocation goals set by each country, management concerns for other stocks and species also identified by each country, and historic patterns in migration and fisheries dynamics.

The Fraser River Panel managed commercial net fisheries and the Canadian "inside" troll fishery in the Panel Area under the terms of the Agreement. The United States catch in Panel Areas (Washington) was not to exceed 16.5% of the Total Allowable Catch (TAC) of Fraser River sockeye salmon, minus a payback of 56,000 fish from past years. Panel Area fisheries in Canada were managed by the Fraser River Panel and Canadian fisheries outside the Panel Area were to be managed by Canada in a manner that anticipated and accommodated catches in United States fisheries.

Canada provided the Panel with run-size forecasts on February 13, 14, 2002 and rules for calculating spawning escapement targets for Fraser River sockeye salmon on April 16, 17, 2002. Canada provided run-size forecasts at the following probability levels: 25%, 50%, 75%, 80% and 90%.

On June 19, 20, 2002, the Panel developed fishery plans for forecast run sizes at the 50%, and 75% probability levels, which were 13,365,000 and 7,911,000 sockeye, respectively (Note: these forecasts included previously unforecasted stocks that were not included in the run-size forecasts provided on February 13, 14, 2002). The corresponding spawning escapement targets were 6,436,000 and 4,141,000 fish, respectively. The projected Total Allowable Catches (TAC) at these run sizes were 6,315,000 and 3,255,000 fish, respectively.

Domestic allocation goals in Washington were as follows: Treaty Indian fishers were allocated 67.7% of the United States TAC minus 23,000 fish of the 56,000 fish payback,

while Non-Indian fishers were allocated the remaining 32.3% of the United States TAC minus 33,000 fish of the 56,000 fish payback. Among Treaty Indians, fishers in Areas 4B, 5 and 6C were allocated a minimum of 12.5% of the Treaty Indian share. As in recent years the allocation targets among Non-Indian fishers were 54% for purse seines, 41% for gillnets and 5% for reefnets.

The commercial share of the Canadian TAC was 4,728,000 fish. The sharing arrangements among commercial fishers were as follows: 37% for Area B purse seines, 14.5% for Area D gillnets, 28.5% for Area E gillnets, 8% for Area G trollers and 12% for Area H trollers.

The Management Plan focussed on the harvest of Summer-run sockeye (mainly Quesnel), which were forecast to be the predominant run timing-group in 2002. Fishery restrictions were anticipated during the early season to protect Early Stuart and Early Summer-run sockeye and in the late season to protect Late-run stocks (15% exploitation rate limit due to their probable early river entry and associated high mortality rate). Several Fraser River and non-Fraser River chinook, chum, coho, and steelhead stocks were identified by each country as warranting conservation concerns.

Research studies were conducted to help determine the cause(s) of the early river-entry behaviour of Late-run sockeye. This research included tagging, physiology, parasitology, oceanography and other studies.

The forecast of the diversion rate of Fraser River sockeye through Johnstone Strait was 27%. The forecasts of run timing (50% cumulative migration through Canadian Area 20 - Juan de Fuca Strait) were June 30 for Early Stuart sockeye and August 8 for Chilko sockeye.

Catches of Fraser River sockeye salmon in all fisheries totaled 4,166,000 fish. Canadian catches amounted to 3,561,000 sockeye, United States fishers harvested 449,000 fish, and test fishery catches totaled 156,000 sockeye. Canadian catches included 2,183,000 in commercial, 1,134,000 in First Nations', 128,000 in recreational, 7,000 in charter fisheries and 109,000 Weaver Creek sockeye in an "excess salmon to spawning requirements" (ESSR) fishery in the Harrison River. Within the United States catch, 434,000 fish were harvested by commercial fishers and 15,000 fish were taken in ceremonial and subsistence fisheries. Commercial fishery catches in both countries summed to 2,617,000 fish.

The Stock Monitoring program provided in-season estimates of abundance, migration timing and diversion rate of Fraser River sockeye salmon throughout the fishing season. Peak migration timing referenced to Area 20 was July 4 for Early Stuart sockeye (one day later than normal for the cycle line), July 30 for Early Summer-run sockeye (two days later than expected), August 8 for Summer-run sockeye (five days later than normal) and August 13 for Late-run sockeye (approximately seven days earlier than normal). The overall diversion rate of Fraser sockeye through Johnstone Strait in 2002 was estimated at 51%.

The Racial Identification program provided estimates of stock composition for catches in commercial, First Nations' and test fisheries. DNA data, scale characteristics, parasite data and length data were employed to estimate these proportions. These estimates were then used to estimate the run size and gross escapement of individual stock groups. The

results of DNA analyses were primarily used in 2002 due to the high accuracy of this stock identification methodology.

Post-season estimates of the total abundance for the Summer-run and Late-run run timing-groups have higher than normal uncertainty due to incomplete spawning ground assessments. Post-season estimates of total abundance by run-timing group were 63,000 Early Stuart, 796,000 Early Summer-run, 6,101,000 Summer-run and 7,897,000 Late-run adults, for a total of 14,857,000 adult Fraser sockeye. The abundance of Early Stuart and Summer-run sockeye was 40% and 32% lower, respectively than the 50% probability level forecasts, while the abundance of Early Summer-run and Late-run sockeye was 17% and 121% higher, respectively than the forecast. Overall, the actual return was 11% higher than the forecast of 13,366,000 adults at the 50% probability level. Among Early Summer-run stocks, the Scotch/Seymour stock-group dominated the run. Among the Summer-run stocks, the Quesnel sockeye comprised the largest portion of the production. The largest Late-run return was to Adams/Lower Shuswap stocks.

Near-final estimates of spawning escapements to streams in the Fraser River watershed that were enumerated totaled 7,979,000 adult sockeye. Spawning ground assessments of Quesnel sockeye (with the exception of the Mitchell stock) and Birkenhead sockeye were not conducted in 2002 and therefore this estimate of the total Fraser sockeye escapement in 2002 is incomplete. Spawning escapement estimates were lower than the brood year for Early Stuart (-19%) and 104% higher than the brood year for Early Summer-run sockeye. Upstream spawning ground enumeration for Summer-run and Late-run sockeye was incomplete in 2002 and therefore a direct comparison with brood-year escapement levels for these run-timing groups cannot be made. The success of spawning by female sockeye in the entire watershed in 2002 averaged 96%.

Adjusted gross escapement targets (target + management adjustment) for sockeye salmon were nearly achieved or substantially exceeded for each run-timing group based on lower river estimates (in-season Mission escapement plus First Nations' catch below Mission). By this measure, gross escapements were short by 1,000 fish for Early Stuart sockeye and exceeded as indicated for the other run timing-groups: 284,000 fish over for Early Summer-run; 2,204,000 fish over for Summer-run, and 1,068,000 fish over for Late-run sockeye. The total gross escapement exceeded the adjusted target by 3,555,000 sockeye. The gross escapement overages for Early Summer-run, Summer-run, and Late-run sockeye were largely due to Panel action designed to maximize the escapement of Early Stuart, Early Summer-run and Late-run sockeye.

Upriver estimates of gross escapement (catch plus spawning escapement) totalled 2,424,000 sockeye more than the unadjusted target. By run-timing group, gross escapements were 33,000 fish under for Early Stuart, 230,000 fish over for Early Summer-runs, 1,538,000 fish over for Summer-runs and 689,000 fish over for Late-run sockeye. The shortfall in Early Stuart escapement was likely due to en route mortalities caused by high river discharge levels during their upstream migration.

The Total Allowable Catch in 2002 was 5,299,000 fish. In terms of the achievement of international allocation targets, Washington fishers were 381,000 fish short of their share of 830,000 Fraser River sockeye, while Canadian fishers were 1,308,000 fish under their share of 4,469,000 fish (excluding Aboriginal Fishery Exemption catch of 400,000 fish).

Domestic allocation goals in the United States were achieved with relatively good accuracy. Treaty Indian fishers caught 3,000 fish more than their allocation and Non-Indian fishers caught 3,000 fish less. Among Treaty Indians, the catch in Areas 4B, 5 and 6C was 5,000 fish too high. Among Non-Indian fishers, purse seines and reefnets each exceeded their allocation targets by 2,000 and 11,000 fish, respectively, while gillnets were 13,000 fish below their target allocation.

Domestic allocation goals in Canada were not achieved, largely because of the substantial restrictions of fisheries due primarily to conservation concerns for Late-run sockeye. Within the Canadian commercial catch of 2,183,000 Fraser sockeye, Area B purse seines were 71,000 fish under, Area D gillnets were 74,000 fish under, Area E gillnets were 326,000 fish over, Area G trollers were 50,000 fish under and Area H trollers were 132,000 fish under their allocations.

The restrained fisheries in 2002 resulted in low by-catches of other species and stocks that were identified as conservation concerns by the Parties.

In terms of the allocation status for the purpose of calculating catch paybacks in future years, the United States has an overage of 12,000 sockeye and an underage of 21,000 pink salmon.

Note: This Executive Summary is preliminary. The final Executive Summary for the 2002 season will be provided in the 2002 Fraser River Panel annual report when it is published.

B. 2002 POST-SEASON REPORT FOR CANADIAN TREATY LIMIT FISHERIES

Fisheries in 2002 were conducted according to Annex IV arrangements under the Pacific Salmon Treaty that was agreed to between Canada and the United States in June, 1999. The conservation-based approach commits the two Parties to abundance-based management for all stocks covered by the Treaty.

Catches reported below provide the best information available to date, and may change when all catch information for 2002 has been received. The catches are based on in-season estimates (hailed statistics), on-the-grounds counts by Fisheries and Oceans Canada management staff and independent observers, logbooks, dockside tallies, and landing slips (aboriginal fisheries), fish slip data (commercial troll and net), and creel surveys, logbooks and observers (sport and commercial).

Annex fisheries are reported in the order of the Chapters of Annex IV. Comments begin with expectations and management objectives, followed by catch results by species, and where available and appropriate, escapements. The expectations, management objectives, catches and escapements are only for those stocks and fisheries covered by the Pacific Salmon Treaty (PST); domestic catch allocations have been excluded. A table attached at the end of this report summarizes 1993-2002 catches in Canadian fisheries that have at some time been under limits imposed by the Pacific Salmon Treaty.

Transboundary Rivers

Stikine River

Canada developed a fishing plan for the Stikine River based on the catch sharing arrangements outlined in Annex IV, Chapter 1, Paragraph 3 of the PST. Accordingly, the objectives of the 2002 management plan were as follows: to harvest 50% of the total allowable catch (TAC) of Stikine River sockeye salmon in existing fisheries; to allow additional harvesting opportunities for enhanced stocks in terminal areas to target sockeye salmon that were surplus to spawning requirements; to harvest 4,000 coho salmon in a directed coho salmon fishery; and, to allow chinook salmon to be taken in the commercial fishery only as an incidental catch in the directed fishery for sockeye salmon. The 2002 season opened on 23 June, statistical week 26, and ended in statistical week 34 (19 Aug). To address conservation concerns for Tahltan Lake sockeye salmon, commercial gear was limited to one net and the lower Stikine River commercial fishing area was reduced, as it had been in 2001.

Sockeye salmon

The preseason forecast of returning Stikine sockeye salmon, as provided by the Transboundary Rivers Technical Committee (TRTC), was 80,000 fish, including 26,500 Tahltan Lake origin sockeye salmon (20,600 wild and 5,900 enhanced), 15,100 enhanced Tuya Lake origin sockeye, and 38,400 non-Tahltan wild sockeye salmon. For comparison, the previous 10-year (1992-2001) average terminal[1] run size was approximately 197,900 fish.

A total of 17,294 sockeye was caught in the combined Canadian commercial and aboriginal fishery; 60% of the catch occurred in the commercial fishery. The total catch was approximately 58% below the previous 10-year average (1992-2001) of 42,200 sockeye. The preliminary estimate of the total contribution of sockeye from the Canada/U.S. enhancement program to the combined Canadian aboriginal and commercial fisheries is 5,960 fish, close to 35% of the catch. Fishing effort in the commercial fishery was significantly reduced in 2002 due to conservation concerns. A total of 21 days was fished, 61% below average (1992-2001), and the total effort amounted to 169 boat-days, which was 55% below average. For the second consecutive year, the lower Stikine River commercial fishing area was reduced to include the Stikine River from the mouth of the Porcupine River downstream to the Canada-US border. Fishing gear was also reduced for the second consecutive year from the two nets (drift and/or set gillnets) typically fished in years prior to 2001, to one net (drift or set gillnet). Due to poor markets and a large scale tagging study at the Tuya River, no salmon were taken by the Tahltan First Nation under the "Excess Salmon to Spawning Requirements License" (ESSR) which permitted the terminal harvest of enhanced sockeye in the Tuya River.

A total of 17,740 sockeye salmon (10,716 wild and 7,024 enhanced) was counted through the Tahltan Lake weir in 2002. Although this marked a significant improvement over the weir counts observed during the previous five years (average = 11,400), the count fell just short of the management target range of 18,000 to 30,000 sockeye salmon and was 43% below the previous 10-year (1992-2001) average of 31,100 fish. Of the total number of fish enumerated through the weir in 2002, 1,538 females and 1,513 males were collected for

[1] Terminal run size estimate excludes U.S. interceptions that occur outside of the District 108 and 106 gillnet fisheries.

hatchery brood stock and 400 sockeye salmon were dispatched for sample specimens. This left a spawning escapement of 14,289 fish.

The spawning escapements for the non-Tahltan and Tuya sockeye stock groups are estimated indirectly by computing the ratio of Tahltan-to-non Tahltan and Tahltan-to- Tuya components in the total in-river sockeye run. Preliminary post-season escapement estimates, based on egg diameter measurements and otolith thermal mark ratios, include approximately 16,900 non-Tahltan fish and 7,700 Tuya fish. The preliminary estimate for the non-Tahltan sockeye escapement is below the target escapement goal range of 20,000 to 40,000 for this stock grouping, and is 51% below the previous 10-year (1992-2001) average of 36,080 sockeye. The final postseason estimate will be computed after the results from postseason stock identification studies have been completed. Aerial surveys of non-Tahltan sockeye escapement index areas indicated a below average number of spawners in 2002. The cumulative spawning index count of 916 sockeye salmon was 19% below the previous 10-year average.

Based on the in-river run reconstruction of the Tahltan Lake run expanded by run timing and stock ID data in the lower river and estimated harvests of Stikine sockeye in US terminal gillnet fisheries, the preliminary post-season estimate of the terminal sockeye run size is approximately 71,300 fish. This estimate includes 27,900 Tahltan Lake sockeye, 17,000 Tuya Lake sockeye, and 26,400 sockeye of the non-Tahltan stock aggregate. A Stikine run size of this magnitude is 64% below the 1992-2001 average terminal run size of 197,900 sockeye salmon. The preliminary post-season estimate of the Canadian TAC for 2002 is approximately 3,736 sockeye, well below the actual catch of 17,294 sockeye.

In-season management was influenced significantly by run size projections derived from the Stikine Management Model (SMM), which was updated and refined by the TRTC prior to the season. The model is based on the historical relationship between cumulative catch per unit effort (CPUE) and run size and provides three sets[2] of independently generated forecasts: one set based on US District 106 CPUE; another based on Canadian in-river commercial CPUE; and the third, based on Canadian test fishery CPUE. Since the model predictions derived from the test fishery data in 2000 and 2001 were the closest to respective post season estimates of run size, the TRTC decided to depend solely on the test fishery data in the generation of stock size estimates in 2002.

The in-season forecasts were relatively consistent in range in 2002. The run size and TAC projections that were selected from the SMM peaked with in-season estimates of 131,866 total run and 28,426 Canadian TAC in week 30 (week ending July 27). The final in-season forecast generated by the SMM indicated a run size of approximately 112,000 sockeye and a TAC for Canada of approximately 15,900 sockeye. According to this forecast, the Canadian catch slightly exceeded the Canadian TAC by about 1,400 sockeye.

The sockeye mark-recapture programme initiated in 2000, continued in 2002 to examine the feasibility of developing an alternate abundance-based management tool for Stikine sockeye. The preliminary mark-recapture estimate of the total in-river run size is approximately 73,900 sockeye salmon. This estimate is slightly more than the in-river run estimate of 65,062 sockeye based on the traditional method of reconstructing the in-river Tahltan run

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[2] Each set of forecasts includes predictions of the terminal run size of all Stikine sockeye, the Tahltan stock, the Tuya stock and the mainstem stock conglomerate.

then expanding it using stock ID and run timing data. Further analysis is required to investigate which estimate should be used as the final post season estimate.

Coho salmon

Poor coho salmon prices caused fishing effort for coho salmon to be very weak resulting in the lowest catch of coho salmon since the start of the fishery in 1979. The total catch for the season was 82 coho salmon, 84% below the 1992-2001 average of 1,450 coho salmon. All of the coho were taken in the lower Stikine commercial fishery.

To assess the abundance of salmon in the lower Stikine River, a coho salmon mark-recapture program was conducted again in 2002. The preliminary estimate of the number of fish reaching the border is approximately 137,600 coho salmon. Subtracting the in-river catches of 82 coho in the commercial fishery, and 2,596 coho in the test fishery, leaves a potential total spawning escapement of approximately 134,922 coho. This estimate is well above the interim escapement goal range of 30,000 to 50,000 coho salmon. Record high coho salmon abundance was also observed during surveys of spawning index streams in 2002. For example, the combined count from surveys of two reliable indices, the Scud and Porcupine rivers, was 3,016 fish, 61% above the previous 10-year average.

Chinook salmon

The total gillnet catch of chinook salmon in the combined aboriginal and commercial fisheries included 1,362 adults and 578 jacks compared to 1992-2001 averages of 2,368 large chinook and 488 jacks. The count of 7,490 large chinook salmon through the Little Tahltan River weir was the third highest count on record. This count was 17% above the previous 10-year average of 6,391 large fish and 41% above the upper end of the Little Tahltan River escapement goal range of 2,700 to 5,300 chinook salmon. The record Little Tahltan River weir count of 618 jack chinook salmon in 2002 was five times the previous 10-year average of 114 fish. Preliminary results from the Stikine River chinook mark-recapture program suggest a total system-wide spawning population of approximately 45,000 chinook salmon. This estimate is well above the upper end of the system-wide escapement goal range of 14,000 to 28,000 Stikine chinook salmon established by the TRTC.

Joint sockeye enhancement

Joint Canada/U.S. enhancement activities continued in 2002 with approximately 4.3 million sockeye eggs collected at Tahltan Lake and flown to the Port Snettisham Hatchery in Alaska for incubation and thermal marking. The egg collection target of 6.0 million eggs was not achieved primarily because of the below average escapement to Tahltan Lake.

Approximately 2.5 million fry were out-planted into Tahltan Lake in early to mid June. The fry originated from the 2001 egg-take at Tahltan Lake and were mass-marked in the hatchery with thermally induced otolith marks. For the third consecutive year, no fry were planted into Tuya Lake in 2002.

Approximately 1.9 million sockeye salmon smolts were enumerated emigrating from Tahltan Lake in 2002, 90% above the 1992-2001 average smolt count of approximately one million. A preliminary estimate of the contribution of enhanced sockeye to this count is not yet available.

Additional studies were undertaken in 2002 to investigate the feasibility of providing access for sockeye salmon around the lower Tuya River barriers. Eighty-nine radio transmitters and ten acoustic tags were affixed to sockeye salmon dip-netted or gill-netted from a site in the Tuya River located near the mouth. This site is located where the Tuya ESSR fishery usually takes place. Thirty–one of the tagged fish were released at km 54 of the Tuya River, approximately 2 km above a partial fish barrier identified in previous studies, while the remaining fifty-eight fish were released approximately 3.5 km above the lower Tuya River falls. An additional ten fish were affixed with a combination of acoustic/radio tags and released directly into Tuya Lake. All the releases occurred between 24-29 July. A total of 1,810 unmarked sockeye salmon was also released above the falls along with the radio tagged fish. Aerial tracking was conducted on a weekly basis through early September. Four stationary radio telemetry towers were strategically placed along the 140 km of the Tuya River to assess daily migration patterns. Of the 89 fish tagged and released above the Tuya River falls, only five tagged fish (5.6%) successfully migrated to the lake. Four of these five fish had been released at km 54. Most of the radio tagged fish concluded their migration in the lower 10-50 km stretch of the Tuya River. Several radio tagged fish were located in the mainstem Stikine River, with the furthest downstream tag located near the mouth of the Porcupine River. The 10 fish released directly into Tuya Lake were tracked by a field crew stationed at the lake from 28 August to 14 September. Evidence of spawning was not observed, and none of the 1,810 unmarked fish was observed. Most of the tagged fish at large in the lake ceased movement in the southern sector of the lake.

The plan to construct a salmon collection structure in the lower Tuya River including a fishway, trap, and a flow diversion weir was abandoned in August 2002. The fishway, which was to include a fish trap, was intended to increase the harvest capability for enhanced Tuya sockeye salmon while still allowing indigenous species to bypass the capture site. Because of the inherent dangers of blasting at the fishing site (steep canyon with active slopes), in tandem with cost factors associated with the blasting, purchase and installation of a steep-pass fish ladder, it was decided to defer the fishway component of the project. Attempts were made, however, to install a diversion weir to protect the fishing site from high water events. Unseasonably high water in the spring and during the summer, and later in the autumn, ice, resulted in postponing this project until the spring of 2003. Plans are still being considered to install either a fish trap or an abbreviated version of the original fish trap plans; however, this will be a revised design that will not involve blasting.

Taku River

As with the Stikine River, the fishing plan developed by Canada for the Taku River was based on the arrangements in Annex IV, Chapter 1, Paragraph 3 of the Pacific Salmon Treaty. Accordingly, the plan addressed conservation requirements and contained the following harvest objectives: to harvest 18% of the TAC of wild Taku River sockeye salmon plus up to 20% of the sockeye escapement in excess of 100,000 fish; to attain a 50% share of the catch of enhanced Taku River sockeye; to harvest 3,000 to 10,000 coho salmon, depending on in-river run size forecasts, in a directed coho fishery, and; to allow commercial chinook catches to be taken only incidentally in the directed sockeye fishery. The 2002 season opened on 16 June, statistical week 25, and ended in statistical week 33 (week ending August 17).

Sockeye salmon

The Canadian pre-season run outlook was for a sockeye run of approximately 293,000 sockeye, approximately 11% above the previous 10-year average run size of approximately 264,000 sockeye.

The 2002 Canadian sockeye catch totaled 31,208 sockeye, 31,053 of which were caught in the commercial fishery and the remainder, in the aboriginal fishery. The commercial catch approximated the 1992-2001 average of 30,515 sockeye. Enhanced sockeye returns were expected to be low in 2002. The preliminary estimate of the contribution of sockeye salmon from the Canada/U.S. enhancement program to Canadian fisheries is only 50 fish. The estimated total spawning escapement of 109,338 sockeye salmon in the Canadian section of the Taku River, derived from post-season analyses of Canada/U.S. mark-recapture data, is 46% above the mid-point of the interim escapement goal range of 71,000 to 80,000 fish and close to the 1992-2002 average of 101,001 sockeye. Based on weir counts, escapements to the Little Trapper, Tatsamenie and Kuthai lake systems were 12,742, 5,495 sockeye and 7,799, respectively. The Little Trapper escapement estimate is an expansion of a weir count; the weir was flooded out after the run was estimated to have been 62% complete based on average run timing. This estimate is 9% above the 1992-2001 average, whereas, the Tatsamenie count was 32% below average. The Kuthai Lake count was 76% above the 1992-01 average.

In-season projections of the total run size, TAC, and total escapement were made frequently throughout the season based on the joint Canada/U.S. mark-recapture program, the estimated interception of Taku River sockeye in U.S. fisheries, the catch in the Canadian in-river fishery, and historical run timing information. The final in-season forecast indicated a total run of approximately 323,700 sockeye and a total spawning escapement of approximately 111,800 sockeye. The preliminary post season estimate of total (terminal) run size is approximately 318,500 wild sockeye with a TAC of 238,500 to 247,500 sockeye.

Preliminary analysis indicates that the Canadian sockeye catch represented 12.6-13.1% of the TAC. The preliminary estimate of the total Canadian and US combined harvest of enhanced Taku sockeye salmon is approximately 708 fish of which Canada harvested 7.6%.

Coho salmon

The commercial catch of 3,082 coho salmon was approximately 48% below the 1992-2001 average catch of 5,936 coho salmon. None of this harvest was taken in the directed coho fishery, i.e. after week 33. Preliminary mark-recapture data indicated a record spawning escapement of 184,000 coho salmon in 2002. This estimate is more than twice the previous 10-year average of 72,600 fish, and several times the interim escapement goal of 27,500 – 35,000 fish. The preliminary estimate of the total in-river run into the Canadian section of the drainage was 187,700 coho. The spawning escapement and in-river run estimates have yet to be expanded for the portion of the run not covered by the mark-recapture study. According to the new harvest arrangements for Taku coho salmon, Canadian fishers were entitled to harvest up to 10,000 coho salmon at a run size of this magnitude. However, poor prices and market conditions resulted in the commercial fishery being vacated after August 13 (Week 33). In the aboriginal food fishery, a total of 688 coho salmon was harvested.

Chinook salmon

The commercial catch of large chinook, 1,561 fish, was 12% below the 1992-2001 average of 1,782 fish; the catch of 291 chinook jacks was 65% above average. Chinook escapement counts were average or below average in the six Taku River aerial index areas surveyed. The combined index count of 8,281 was 16% below the previous 10-year average of 9,823 chinook. Preliminary estimates derived from the joint Canada/US chinook mark-recapture program indicate a total spawning escapement of approximately 39,605 large chinook salmon, which is well within the escapement goal range of 30,000 to 55,000 large chinook salmon.

Joint sockeye enhancement

Joint Canada/US enhancement activities at Tatsamenie Lake continued in 2002 and an estimated 2,297,000 viable eggs were delivered to the Snettisham Hatchery in Alaska for incubation and thermal marking. The 2002 egg collection did not meet the target of 5.0 million due to a below average escapement and the late arrival of fish at the egg collection site. The experimental passive flow incubators within Tatsamenie Lake were not re-stocked in 2002 due to the low escapement and poor egg-to-fry survival observed in the spring of 2002. The experimental in-lake incubation project, which was initiated on a small scale in 1998, is part of ongoing investigations into techniques that may increase the lower than expected fry-to-smolt survivals of the outplanted enhanced fry.

During the 2001 Tatsamenie Lake egg-take, three "production scale" incubators were loaded with 860,000 eggs. The resultant fry were released in June 2002. The average egg to fry survival was estimated to be less than 15%. Results from previous experimentation with passive flow at Tatsamenie lake had produced favorable survival rates, i.e. >75%.

In June 2002, approximately 2,100,000 fry were transported from Snettisham Hatchery to Tatsamenie Lake in five shipments. One group of approximately 600,000 unfed fry was released within one day of arriving at the lake, while two other groups of fish were fed for 10-15 days prior to release. The 2002 fry feeding procedure was part of an ongoing strategy to determine what combination of feeding and release timing confers the highest survival to the enhanced fry.

The 2002 Tatsamenie Lake sockeye smolt out-migration was estimated to be approximately 223,000 fish. This was somewhat lower than expected in light of the average escapement to Tatsamenie Lake in 2000 (7,575 sockeye).

Alsek River

Although catch sharing of Alsek salmon stocks between Canada and the U.S. has not been specified, Annex IV of the Pacific Salmon Treaty does call for a co-operative development of abundance based management regimes for Alsek chinook, sockeye and coho stocks. Interim escapement goal ranges for Alsek sockeye and coho salmon were initially set by the TRTC at 33,000 to 58,000 sockeye salmon, and 5,400 to 25,000 coho salmon. However, prior to 2000, stock assessment projects to determine system-wide escapements had not been developed except for some limited work on chinook salmon. Instead of managing to system-wide goals, which for the most part have been unverifiable, the TRTC has established index goals for the Klukshu River stocks. Historically, the principal escapement-monitoring tool for chinook, sockeye and coho salmon stocks in the Alsek drainage has been the Klukshu River weir, operated by Fisheries and Oceans Canada and the Champagne-

Aishihik First Nation. The Klukshu River is a tributary to the Tatshenshini River, which is a major salmon producing river system of the Alsek drainage.

Based on joint stock-recruitment analyses conducted on Klukshu chinook and sockeye salmon, Canadian and U.S. managers agreed to a minimum escapement goal of 1,100 Klukshu chinook salmon and a escapement goal range of 7,500 to 15,000 for Klukshu sockeye salmon for the 2002 season. An escapement goal for Klukshu coho salmon has not yet been developed.

Highlights of the 2002 season included above average returns of both sockeye and coho salmon. A total of 120 chinook salmon was harvested in the aboriginal fishery, which was the fifth lowest catch on record and was 50% below the 10-year average (1992-2001) of 243 fish. The aboriginal fishery harvested an estimated 2,194 sockeye salmon, 67% above the 10-year average (1992-2001) of 1,316 fish. A total of 6 coho salmon was harvested in the aboriginal fishery.

The recreational fishery harvested 183 chinook, 40% below the 10-year average. Due to the good escapement of early-run sockeye, retention in the sport fishery was permitted beginning on July 13. The catch after this date included 92 sockeye retained and 71 sockeye live-released. A total of 693 coho salmon was kept and an additional 125 were released. As a result of the good coho salmon returns, the daily catch limit was increased from two to four coho on October 4th.

The Klukshu weir count of 2,240 chinook salmon was 18% below the previous 10-year (1992-2001) average of 2,741 fish. The estimated spawning escapement of 2,134 chinook salmon above the weir achieved the minimum escapement goal of 1,100 Klukshu chinook salmon.

The weir count and total escapement of Klukshu River sockeye salmon was 25,711 and 23,587 fish, respectively. The early-run count of 11,904 sockeye, was almost four times the previous 10-year (1992-2001) average of 3,242 fish, and the late-run count of 13,807 fish was 46% above the previous 10-year average of 9,445 sockeye salmon. The overall spawning escapement of 23,587 sockeye salmon in the Klukshu River was well above the escapement goal range. However, below average sockeye escapement was recorded in the neighbouring tributary of Village Creek where an electronic counter recorded an estimated 2,761 sockeye, 22% below the historical average.

Similar to the sockeye count, which was well above average, the Klukshu weir count of 9,921 coho salmon was the highest count on record; the previous 10-year average is 2,053 fish. The weir is usually removed prior to the completion of the coho return due to icing conditions and generally does not include fish that migrate after mid-October. In 2002, the weir was pulled on October 16th.

Several projects were continued in 2002 to collect background data for use in developing abundance-based management regimes for chinook and sockeye. These included mark-recapture programs to estimate the escapement of chinook and sockeye in the Alsek drainage. DNA sampling was also conducted to add samples to the stock ID baseline for this system. A sockeye radio tagging study was continued to determine run-timing and spawning distribution. Preliminary results of the sockeye mark-recapture program indicated a total in-river run sizes of 82,659 fish. In the sockeye radio-tagging program, sockeye were found to be widely distributed throughout the Tatshenshini drainage as well as in the Alsek

River upstream as far as Turnback Canyon. No fish were tracked above this point in the Alsek River.

Northern British Columbia Pink Salmon

Areas 3-1 to 3-4 Pink Net Catch

For the year 2002, Canada was to manage the 3-1 to 3-4 net fishery to achieve an annual catch share of 2.49 percent of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon.

In the Canadian northern boundary area, pink salmon returns were anticipated to be strong for Area 3 as a result of good escapements in the brood year. Meanwhile, Area 4 pink salmon expectations were poor due to a poor brood year return, although the actual return was average. A strong return was expected for the SE Alaska pink stocks adjacent to the northern boundary area. The Canadian pink catch in 2002 in Sub-areas 3-1 to 3-4 was 876,631 and a very preliminary estimate of the Alaska stock component of this catch is estimated to be 520,362. This harvest estimate is 1.64 % of the AAH and is below the allotted 2.49 % of the AAH.

The total Canadian pink catch of 876,631 in sub-areas 3-1 to 3-4 is much lower than the 1985-2000 average catch of 1.46 million. The average harvest resulted from a combination of average returns of Skeena area pink stocks, and management restraints on Canadian net fisheries in Sub areas 3-1 to 3-4 to reduce the harvest of less abundant Skeena sockeye and coho stocks. The percentage of the 2002 Area 3 net catch taken in sub-areas (1-4) was 46%, which was well below the 1985-2000 average of 58%.

Pink escapements in 2002 were at or above target in Area 3 and the Skeena.

Area 1 Pink Troll Catch

Area 1 Pink Troll Catch

For the year 2002, Canada was to manage the Area 1 troll fishery to achieve an annual catch share of 2.57 percent of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon.

The Canadian commercial troll fishery in Area 1 was open in the northern portion of the area from August 1 to September 30. The fishery harvested a total of 41,418 pink salmon, with an estimated of 28,438 of Alaskan origin. This will be well below the annex agreement for 2.57 percent of the AAH of Alaskan Districts 101, 102 and 103 pink salmon.

Chinook Salmon

AABM Fisheries

North Coast B.C. (NBC) troll and Queen Charlotte Islands (QCI) sport fisheries:

The abundance index for North Coast B.C. troll and Q.C.I. Sport fisheries in 2002 was 1.45 (CTC report (02)-3), which allows a total catch of 192,700 chinook in these fisheries.

Preliminary estimates indicate a total catch of 136,048 chinook. 94,748 caught in commercial troll fisheries and 41,300 caught in sport fisheries.

The North Coast B.C. troll fishery was opened for chinook fishing from October 1, 2001 to June 8, 2002 and from September 8 to 30, 2002. A total of 92,537 chinook were caught. The size limit was 67 cm. Barbless hooks and revival boxes were mandatory in the troll fishery.

A test fishery was conducted in selected areas in July and August. 2211 legal sized and 496 sub-legal sized chinook were caught. (Sub-legal chinook are not included in the totals.)

Sport fishing was open with a daily limit of 2 chinook and a possession limit of 4 chinook. An estimated 41,300 chinook were caught. A minimum size limit of 45 cm was in effect and barbless hooks were mandatory in the sport fishery.

ISBM Fisheries

Northern and Central BC Fisheries:

Fisheries included in this category are commercial net fisheries through out north and central BC, marine sport fisheries along the mainland coast and freshwater sport, and Native fisheries in both marine and freshwater areas. Under the PST, obligations in these fisheries are for a general harvest rate reduction (estimated in aggregate across fisheries) for ocean mixed-stock fisheries and for stock-specific objectives (i.e., achieving the escapement goal) in terminal areas.

North Coast commercial gillnet catches totalled 11,041 chinook from Areas 3 to 6 (from hail catch data). The majority (62%) of this catch occurred in Area 4. The Area 4 catch reflects smaller terminal runs of chinook salmon to the Skeena River in 2002 and reduced gillnet effort directed on sockeye salmon. The Skeena River test fishery index for chinook salmon dropped in 2002 following a record index in 2001.

Central Coast commercial gillnet catches totalled 4,827 chinook. Virtually all of these chinook were caught in Area 8 (only 2 caught in Area 7).

Tidal sport catches near the mainland coast of Northern BC in Areas 3 and 4 landed an estimated 8000 chinook. Catch in 2002 was less than 2001 but sport effort has continued to increase in response to recent large returns to the area. No estimate of sport catches from in-river fisheries was available for the North Coast. However, fishing was reported as good in the Nass and Skeena systems and increased effort was evident.

For the Central Coast areas 7, 8, and 9, sport logbooks provided a catch estimate of 6305 chinook in tidal waters and a creel survey provided a catch estimate of 723 chinook in the non-tidal waters of the Bella Coola and Atnarko Rivers. The lodges reported the following tidal chinook catch figures: Area 7 – 3259, Area 8 - 1462 and Area 9 – 1584. This figure does not include a catch estimate for portion of the tidal fishery in these areas not participating in the logbook program i.e. private anglers. A recreational catch monitoring program conducted in 2000 and 2001 in Area 9 indicated that the total private angler catch in a given season is comparable to the lodges. Current estimates of the 2002 tidal sport fishery in the Central Coast indicate fewer landings of chinook than 2001. The Area 8 non-tidal

sport fishery reported a catch of 332 chinook in the Bella Coola River and 391 chinook in the Atnarko River.

Catches in 2001 Native fisheries in the North Coast consisted of approximately 14,837 chinook. This represents approximately 60% of catches in Native fisheries in 2002. The estimated catch in the North Coast was 5179 from tidal-area fisheries and 9658 from non-tidal areas. The majority of these catches occurred in Areas 3 and 4 (Nass and Skeena rivers). The reported catch in the Central Coast was 3,032 chinook, 200 from tidal area fisheries and 2,832 from non-tidal areas. The majority of these catches were from the Bella Coola River in Area 8, which had a good return of chinook salmon.

Chinook Total Fishing Mortality

Seines were not permitted to retain chinook in any of the North and Central Coast fisheries. Observers were used to estimate the total encounters of chinook by seine gear in Areas 3 (analysis of this data is incomplete).

Chinook encounter rates were reported to the "Fisheries Operating System" (FOS) from North Coast troll fisheries. An estimate of 7931 chinook were released. 2331 sub-legal (<67 cm) chinook were released during retention periods and 5645 mixed legal and sub-legal chinook were released during chinook non-retention fisheries.

Overview of Northern BC Chinook Stock Status

Since an assessment of the ISBM fisheries will be relative to the escapements achieved in the chinook indicator stocks, a brief overview of the 2002 returns is provided. Northern BC terminal runs were weaker than 2001: Yakoun River escapement was estimated at 3000 chinook. Preliminary estimates of Nass River escapements were 15,605. Skeena River chinook escapements were approximately 47,748. Kitimat River escapements were estimated at 22,000 (hatchery staff estimate).

In the Central Coast terminal runs were near 2001 estimates. Final escapement estimates have not been completed, however, preliminary data suggests the Dean River received an escapement of 3800 chinook. Final chinook escapement numbers to the Bella Coola/Atnarko Rivers is not complete at this time. Preliminary analysis suggests that the run size was approximately 14000, which is below escapements for 1999 and 2000. The escapements for the Kilbella and Chuckwalla chinook were 1600 and 600, respectively. The Wannock River deadpitch was recently completed yielding an escapement estimate of 2800 chinook. A total of 119 chinook passed through the Docee River fence in 2002, down from 300 in 2001 and 500 in 2000.

Fraser River Sockeye and Pink Salmon

Fraser River Sockeye Salmon

The sockeye run-size forecast for 2002 resulted in a preseason plan that incorporated both the 50% and 75% probability levels of abundance (13.4 million and 7.9 million respectively) with a 25% diversion estimate through Johnstone Strait. The preseason plan also incorporated provisions to protect Late Run stocks. The U.S. share of the annual Fraser River sockeye salmon total allowable catch (TAC), harvested in the waters of Washington

State, was set at 16.5% with an adjustment of a 56,000 payback from an overage in U.S. catch in 2000.

Brood year returns for most Fraser sockeye stocks, faced adverse migratory conditions resulting in significant pre-spawn mortality rates. The 2002 forecasts for the four management aggregates are as follows: Early Stuart was 105,000 (50% probability); The Early Summer forecast was 678,000 (50% forecast). Concerns were raised regarding the potential impact fisheries could have on the later timed Scotch-Seymour stocks of the Early Summer aggregate which co-migrates with mid-Summer run stocks. The forecast for the mid-Summer sockeye aggregate of 9 million (50% probability) is significantly greater than the cycle mean of 5.3 million. This was mainly attributed to dramatic increases in returns to the Quesnel system. The 2002 Late Run forecast for a dominant Adams run, was estimated to be 3.6 million (50% probability). This forecast is significantly lower than the cycle mean of 9.3 million as a result of the 1998 brood year experiencing high rates of pre-spawn mortality, low escapement, and poor freshwater survival.

Late Run sockeye have historically delayed in the Gulf of Georgia for 4-8 weeks prior to entering the Fraser River. In recent years this behaviour has changed to one where there has been immediate river entry. This unusual behaviour has been associated with high levels of en-route and pre-spawn mortality, escalating to levels of 90% and greater in 2000 and 2001. To address the high probability of this occurrence, the Fraser River Panel adopted a pre-cautionary management strategy outlined below.

The pre-season plan made several assumptions, including: there would be limited in-season information available on key parameters such as run size and timing for Late Run sockeye; and Late Run sockeye would continue their early upstream migration behaviour and associated en-route and pre-spawn mortality. As a result, fisheries were planned so that there would be:

No directed fisheries on Late Run fish

A maximum exploitation rate of 15% on Late run sockeye (excluding Birkenhead)

Minimal incidental impacts on Late Run sockeye in all fisheries

The Canadian fishing plan also addressed conservation specific-concerns for:

Upper Fraser River/Thompson River coho
Nimpkish River, Rivers Inlet & Smith Inlet sockeye
West Coast of Vancouver Island Chinook
Thompson River steelhead
Inshore Rockfish

The current in-season estimated return of Early Stuart (62,100) corresponds to the 75% probability forecast of 59,000. In contrast, the Early Summer in-season estimate of 900,000 is above the 50% probability forecast (678,000). The in-season estimate of 6.8 million mid-Summers is between the 50% and 75% probability forecasts (9.0 million and 5.2 million, respectively) while the in-season estimate of Late run sockeye (7.8 million) exceeds the 25% probability forecast (5.1 million) by a wide margin.

While the total return of sockeye was higher than forecast, opportunities were limited by Early Summer run conservation measures at the start of the Summer Run migration period. Opportunities were also limited by the extraordinary early migration timing of the Late Run stocks, which were first identified in approach waters on July 8th. This was the first year in which DNA analysis was used extensively to identify the different Fraser River sockeye stocks. Its use in separating early arriving Late Run sockeye from other co-migrating sockeye stocks was invaluable. The ability to estimate in-season run size for Summer and Late Run stocks was further compromised by the abrupt change in the diversion rate through Johnstone Strait. Prior to early August it was estimated that 20 percent or less of the return was entering the Gulf of Georgia through Johnstone Strait whereas by August 12th, the estimated diversion rate was 70% through Johnstone Strait.

Harvest opportunities were available in Canada for all user groups, including First Nations, commercial, selective and recreational fisheries. The management actions taken by the Fraser Panel for both the Early Summer and Late Run stocks resulted in gross escapements exceeding targets for Early Summer, Summer, and Late Run stock aggregates.

Late Run sockeye migration into the Fraser River in 2002 was extremely early. DNA analysis of samples taken from the Whonnock in-river test fishery showed the presence of Late Run sockeye beginning July 24th, which rapidly increased as the run progressed. The early arrival of the Late Run sockeye and the inability to determine the actual run size, resulted in the 15% exploitation rate ceiling being achieved much earlier than anticipated pre-season. Analysis of the data from a study carried out in 2001, suggested that the earlier migrating portion of Late Run sockeye experience much higher pre-spawn mortality than those migrating later. As a result of the continuing early entry pattern of Lates in 2002 the Panel adopted a policy whereby Late Run sockeye caught which entered the Fraser River up to and including August 17th, would not contribute to the 15% exploitation rate ceiling.

Preliminary estimates of Fraser River sockeye catch in 2002 are as follows:

Total Fraser Sockeye Caught	4,053,100
Test/charter fisheries	162,500
Canadian Catch	
Canadian commercial fisheries (include Area 20 seine fishery & selective fisheries)	2,182,700
Canadian First Nation fisheries	1,130,400
Canadian recreational fisheries	127,400
United States Catch	
U.S. Treaty Indian non-Indian fisheries	434,600
U.S. Treaty Indian ceremonial fisheries	15,500

The above numbers were taken from the PSC TAC table from 31-Oct. Test/charter catch includes Albion test fishery.

The preliminary escapement estimate for Early Stuart sockeye is 24,604 which is well below the escapement goal of 75,000. The in-season gross escapement estimates for the Early Summer, Mid-Summer Run and Late Run escapement are 646,900, 4,916,800 and 6,627,100, respectively. A summary of preliminary

spawning escapement estimates for all stock groups will not be available until February.

Fraser River Pink Salmon

2002 was an off-year for Fraser River pink salmon.

Southern B.C. Chinook Salmon

Chinook salmon in southern BC are managed under the coastwide abundance based management regime agreed in the 1999 PST. This includes allowable catches for aggregate fisheries (AABM) in southeast Alaska, northern BC, and off the WCVI. It also includes subsequent fisheries managed to individual stock requirements (ISBM). In addition to the PST regime, Canada implements management actions as required to ensure conservation of Canadian origin chinook and meet allocation requirements.

WCVI AABM Chinook fisheries

The WCVI troll fishery and the "outside" sport fishery are included here. For the period October 2001 through September 2002 the chinook abundance index was 0.95 of the base period (calib #0204). This provided a total allowable catch of 203,200 chinook in the WCVI troll and outside sport fishery. The preliminary estimates of troll catch for this period are 133,693 chinook (>55 cm Fork Length) and 22,009 (>45 cm) sport catch results in a combined catch of 155,702 chinook.

WCVI chinook fisheries were limited in 2002 by conservation concerns for upper Fraser River (Thompson River) coho and WCVI origin chinook salmon. Directed chinook fisheries were conducted outside the period late June through mid-September to avoid stocks of concern. Selective fishing practices were mandatory, including single barbless hooks and "revival tanks" for resuscitating coho salmon prior to release.

WCVI troll fishery – Chinook AABM

WCVI troll fishing opportunities were provided consistent with a Department commitment to distribute winter fisheries to improve the economic base for the fleet and local communities while increasing flexibility in harvest opportunities and distributing the harvest over a broader time (and broader range of stocks). Troll fisheries were conducted during the following periods:

Table 1. Summary of the WCVI Area G commercial troll fishing opportunities.

Fishing Period	Chinook Catch	Comments on fishery
October 9 – November 28 2001	3284	Full fleet opportunity
November 29-December 31 2001	848	Limited access fishery
January 1-January 31 2002	1869	Limited access fishery
April 14-23 2002	9145	Both commercial and assessment fisheries were carried out during this period. Fisheries were not conducted during the period late March until mid-April to avoid impacts on earliest timing upper Fraser River spring run chinook.
April 24-June 8 2002	96584	Full fleet fishery. Fishery closed to assess coho encounter rate before re-opening.
June 9-June 20 2002	13223	Full fleet fishery. Low coho encounter rates resulted in extending the June fishery.
July 28-August 3 2002	0	in Areas 123 to 127 targeting on Fraser River sockeye. Both commercial and assessment fisheries were carried out during this period. Preliminary data indicates that this fishery encountered at least 5102 chinook, all of which were released.
September 21-September 30 2002	3845	Both commercial and assessment fisheries were carried out during this period. The fishery was restricted to offshore areas in order to avoid WCVI chinook.

The minimum size limit of chinook during these periods was 55cm fork length. Fisheries were monitored to determine encounter rates of other species and released chinook. Biological sampling was conducted for such things as size distributions, and stock compositions (via CWT, DNA and otolith samples). Incidental catch of chinook was also permitted during a troll fishery in Barkley Sound directed at sockeye salmon (June 10-11, June 17, June 24, July 8, July 15-16, July 21-22, July 28-30). The chinook catch in this fishery, however, was very small with only 9 chinook reported kept and 39 chinook released.

WCVI sport fishery – Chinook AABM

Conservation of local WCVI non-enhanced chinook stocks and mixing of low abundance coho stocks were the primary concerns for 2002 area sport allocations. Selective fishing regulations such as barbless hooks, release of unmarked coho and size regulations were enforced in order to lower post-release mortality and impacts on stocks of concern. For the outside sport fishery the chinook daily bag limit was two chinook greater than 45 cm.

The sport fishery was monitored through a creel survey and reported catches from lodges. Observers interviewed 6421 anglers at 21 landing sites from June 01 until October 22. The estimated "outside" sport catch was approximately 22,009 chinook. The 2002 outside chinook catch was 39% lower than 2001. Outside effort for 2002

was 43% lower than 2001. This reduction is largely due to angling effort moving to the inshore terminal areas as restrictions were reduced.

Southern BC Chinook ISBM

Fisheries in this category include commercial net fisheries in Johnstone Strait, Juan de Fuca Strait, Strait of Georgia and the Fraser River, the Strait of Georgia troll fishery, sport fisheries along the "inside" of the WCVI plus other marine sport fisheries and fisheries in local rivers, and Native fisheries in both marine and freshwater areas. In general, these fisheries were quite limited during 2002, and are briefly described below.

Southern BC commercial net – chinook ISBM

Commercial net fishing occurred in Johnstone Strait, the Strait of Georgia, Fraser River, the Strait of Juan de Fuca, Nitinat and Nootka Sound. Due to limited fishing opportunities and the requirements to release chinook taken in nets, the reported released chinook in these areas was approximately 1025 in Johnstone Strait, 22 in the Strait of Georgia, 157 in the Fraser River, 1,409 in the Strait of Juan de Fuca 40 in Nitinat, and 138 in Nootka Sound for all commercial net types. Retained catch was only permitted by Area D Gillnet (Johnstone Strait-596, Strait of Georgia-14, and Barkley Sound-237), and Area E GN in the Fraser River-4293. It should be noted that these estimates are calendar year estimates.

Southern BC commercial troll – chinook ISBM

Area G Troll did not conduct any test or commercial fisheries during the 2002 sockeye or pink season in areas 111, 11, or 12.

Area H troll fisheries were conducted in areas 12, 13, 18, and 20 from July 21-August 30 and were limited to incidental chinook retention during sockeye and pink fisheries. The total catch of chinook was 369 kept and 65 released. These fisheries were monitored to determine encounter rates and size distributions. It should be noted that these estimates are calendar year estimates.

Southern BC marine sport fisheries – chinook ISBM

For Johnstone Strait and the Strait of Georgia north of Cadboro Point sport catch regulations included an annual bag limit of 15, a daily bag limit of 2 and a size limit of 62 cm. For the Canadian portion of Juan de Fuca Strait, the daily bag limit of 2 chinook over 45cm and a seasonal limit of 20 were in effect.

The catches in these marine fisheries are monitored by creel surveys in two main areas: 1) Juan de Fuca sport including Victoria and Juan de Fuca Strait through Area 20-1, and 2) Strait of Georgia. Monitoring of the Strait of Georgia fishery (April to September) and Juan de Fuca Strait sport fishery (January to December) has been fairly consistent from year to year using an access point (landing site) survey for collecting catch and bio-data information combined with an aerial survey for effort counts.

The overall effort in Georgia Strait increased by 3% while catch increased by 8%, largely on the basis of an excellent year in the Campbell River and Courtenay areas. The southern Georgia Strait fishing effort and catch declined somewhat from 2001. Juan de Fuca Strait effort increased by 3% and catch by 11%.

On the WCVI, the "inside" sport fishery for chinook was more restricted than the "outside" fishery in order to protect returning WCVI chinook. Spot closures were implemented near-shore in Areas 21 through 26 in order to direct effort away from areas where WCVI chinook were generally concentrated and where there was historically high angling pressure. These spot closures were in place from August 1 through August 20 for NWVI and August 12 through 31 for SWVI. Inside areas that permitted the retention of chinook had bag limits of two, only one of which could be over 77cm. Terminal closures were in affect from July 15 through October 15 for NWVI and August 1 through October 31 for SWVI. Estimated catch for the inside sport fishing areas is 35,945 chinook.

Recent fishing effort and catches for the major sport fisheries are reported in the following table.

Table 2. Sport fishing effort (boat trips) and catch of chinook salmon in southern BC sport fisheries, other than the inside WCVI fisheries. Data for these fisheries based on creel surveys.

Year	Fishing Area	Survey Period	Effort	Chinook Kept
2002	Area 20-1	June-Oct	4,155	5,033
2002	Juan de Fuca St.	Jan-Oct	62,380	24,084
2002	Strait of Georgia	April-Oct	164,903	52,979
2002	Johnstone Strait	Aug1-31	5,016	2,330
2001	Area 20-1	June-Sept.	5,827	5,752
2001	Juan de Fuca St.	Jan-Dec	54,127	16,778
2001	Strait of Georgia	April-Sept.	141,899	31,237
2001	Johnstone Strait	July-Aug.**	10,825	3,759
2000	Area 20-1	June-Aug	4,926	2,659
2000	Juan de Fuca St.	Jan.-Dec.	36,883	6,746
2000	Strait of Georgia	April-Sept.	127,438	22,114
2000	Johnstone Strait	July-Sept.	36,165	11,437
1999	Area 20-1	June-Aug	6,038	5,770
1999	Juan de Fuca St.	April-Dec.	39,484	8,984
1999	Strait of Georgia	April-Sept.	124,043	34,909
1999	Johnstone Strait	July-Sept.	39,151	7,813
1998	Area 20-1	June-Aug	4,564	3,197
1998	Juan de Fuca St.	April-Oct.	43,457	6,438
1998	Strait of Georgia	April-Sept.	119,452	14,166
1998	Johnstone Strait	July-Sept.	19,630	2,991

As part of the creel surveys, encounter rate information was collected for legal and sub-legal chinook and for legal and sub-legal coho size categories. Post-release mortality information for the recreational fishery was determined from studies

conducted in 2000-2001 and detailed in the Canadian Stock Assessment Secretariat, Research Document 99/128 (CSAS, Doc 99/128). The mortality rates for legal size fish were: Seine, coho, 25%; Gillnet, coho, North 70% and South 60%; Troll, coho, 26%; Sport, coho, 10%; and Sport, chinook, 15%. Post-release mortality for sub-legal (<33cm) was set at 32%. Legal and sub-legal releases of chinook in Georgia Strait increased over 2001 by 17% while an increase of 15% was experienced in Juan De Fuca Strait. An estimate of total chinook mortality in the sport fishery is as follows:

Table 3. Total 2002 catch plus encounters of chinook (released) and estimated post-release mortalities:

Area	Survey Dates	Catch	Effort	Legal Release	Mortality @ 15%	Sub-legal Release	Mortality @ 32%	Total Mortality
Juan de Fuca Strait	Jan.-Dec.*	24,084	62,380	5,449	817	12,005	3,482	28,383
Georgia Strait	April-Oct.	52,979	164,903	5,113	729	52,390	16,764	70,330
Johnstone Strait	Aug	2,330	5,016	368	55	1,368	438	493
Inside WCVI	July-Sept.	35,945	37,528	19,893	2,984	11,099	3,552	6,536
TOTALS:		115,338	269,827	30,823	4,585	76,862	24,236	105,742

* data to end of October only

Southern BC non-tidal sport fisheries – chinook ISBM

The Lower Fraser sport fishery was monitored from June to early September. Due to problems/delays in data entry and analysis estimates for any of the Fraser fisheries are not yet available.

There was a non-tidal chinook and coho sport fishing opportunity on the Somass / Stamp River (Area 23) from September 3 to December 31. Anglers were permitted to retain 1 chinook less than 77cm (fork length), 4 coho two of which may be adults (greater than 35cm fork length) per person per day This fishery was monitored for coho and chinook encounter rate information from September 25 to October 31/2002. The survey consisted of exit point interviews and observations. Creel observers conducted instantaneous effort counts at six locations twice a week, one week day and one weekend day. Fishery officers drifting and patrolling the river provided some angler effort and anecdotal information. Estimates are preliminary at this time, with 907 coho and 77 chinook harvested during this fishery.

Southern BC First Nations fisheries – chinook ISBM

No information is available at this time on First Nations' catch of chinook salmon in 2002.

Chinook Stock Status

Since an assessment of the ISBM fisheries will be relative to the escapements achieved in the chinook indicator stocks, a brief overview of the 2002 returns is provided.

Upper Georgia Strait / Johnstone Strait

Currently only 3 systems are monitored in Areas 12 and 13 with some level of consistency. The Nimpkish River is monitored using standardized swim surveys and stream walks by the hatchery staff. A fishwheel is used in the mainstem and a fence on Devereux Creek (small tributary) to track escapement on the Klinaklini system, and the Quinsam hatchery staff conduct a mark-recapture program to estimate escapement on the Quinsam/Campbell system. Other systems are covered using intermittent aerial surveys.

Nimpkish: Better than average returns for both adult and jacks. Broodstock goal attained.

Klinaklini: The return of chinook adults and jacks to the system was better than average and the second highest escapement since the inception of the assessment program in 1997. It should be noted that escapement estimates for the Klinaklini improved dramatically in 1997 when the intensive assessment program began. Total enumeration of Devereux Creek spawners was accomplished this year using an underwater camera. The escapement totals for Devereux Creek appear to be healthy considering the size of the stream.

Quinsam/Campbell: At this point the numbers indicate a slight decline from 2001 for both adults and jacks in both Campbell and Quinsam Rivers, however still better than average. The improved escapements over the past couple of years seem to be holding at a steady level. Broodstock goal of 1604 adults attained.

Lower Georgia Strait

Overall decline in chinook returns in 2002 for both LGS indicators (Cowichan and Nanaimo) and major hatchery stocks. Although down somewhat from the peak in 2001, we have seen a generally increasing trend in hatchery returns since the early 90's. The Cowichan and Nanaimo Rivers, on the other hand, have been in a declining trend since 1995.

One concern in 2002 has been the very low water levels into the late fall. For many systems where low water conditions persisted we can expect reduced spawning success.

Big Qualicum: Total return and escapement declined from the 2001 levels by 23% but was still above the five-year average. Broodstock capture of 3112 adult chinook. There was a considerable reduction in First Nations in-river harvest over 2001 with only 329 adults taken compared with 2489 last year.

Puntledge: Total return and escapement for the fall stock declined by 20% from 2001 but was still the second highest return on record. The summer run was less than half of the 2001 return but still well above the five year average. Broodstock capture of 900 adult chinook for the summer run and 1045 adults for the fall stock.

Nanaimo: Escapement and total return declined by approximately 25% but remained near 5 year average return for both fall and spring stocks, but with excellent returns of jacks. Broodstock goal of 184 adults for the fall stock and 196 adults for the summer stock were acquired by the hatchery. There was an in-river First Nations gillnet fishery for the first time in over ten years and catch was reported to be 213 adults.

Cowichan: Approx. 33% decline in escapement from 2001, (with a reduced return of jacks), but a slight increase in total return. Broodstock goal of 1400 adult chinook achieved. According to a First Nations biological sampler, there was a significant increase in First Nations in-river catch with approx. 6 times the amount of adults taken compared to 2001. The in-river First Nations chinook catch was estimated to be approximately 3400 fish.

Lang: Slight decline over 2001 with good return of jacks. Broodstock goal of adult chinook attained.

Upper Fraser River

Early spring chinook returns looked good at Spius and Coldwater (>1000 spawners each); however, upper Chilcotin was poor. Near average returns for northern populations (Nicola approx. 9000 spawners); however, some northern populations could not be estimated due to flooding and siltation.

Fraser River

Summer chinook returns continued to be strong. Yearling summer returns were reasonable, with some bright spots (Nechako >10,000; Chilko approx. 10,000). Under-yearling summer returns were very good with South Thompson >40,000, Lower Adams >7000, Little River >10,000 and Lower Shuswap >25,000.

Lower Fraser River

Fall chinook (Harrison River white chinook stock) returned in large numbers (preliminary mark-recapture value approx. 135,000 Age 3+ chinook) to the Harrison plus Chilliwack rivers; and strong Jack chinook returns were noted.

West Coast Vancouver Island

Escapements to hatchery systems were generally near or above expected levels. For the Stamp River / Robertson Creek Hatchery indicator, the terminal return will be near expected levels. Abundance of age 2 "jack" males continues to improve over levels in the 1990's. Chinook abundance in the wild rivers is improved, but to a much smaller degree than the systems supplemented with hatchery production. Returns to Kyuquot Sound and Clayoquot Sound, both predominantly wild, appear to have improved only marginally. Concerns for wild WCVI chinook rebuilding continues.

Southern B.C. Coho Salmon

Coho management in southern BC

Canada's management objective for coho in 2002 was to limit the exploitation rate on Thompson River coho to a ceiling of 3% across all Canadian fisheries. There was no retention of wild coho allowed in southern BC recreational or commercial, apart from some terminal sport fisheries along the WCVI and a very limited experimental fishery in the terminal portion of Area 23 (Alberni Inlet). Some First Nations retained wild coho, usually caught incidental to another target species.

Commercial Fisheries

Southern BC commercial fisheries were regulated so that impact on coho, and especially Thompson coho stocks, was minimized. There was a requirement to apply selective fishing techniques, which included gear restrictions such as barbless hooks for trollers, seine bunt restrictions, mandatory use of revival tanks in all commercial fisheries, and more. Monitoring included requirements for daily catch reporting, mandatory logbooks, hailing catches on a regular basis, independent on-board observers on vessels when requested. In areas with potential high coho abundance, test fishing was conducted prior to openings to identify risk of high coho encounters. If coho were abundant, then time and area restrictions were implemented to reduce the encounters of wild (unmarked) coho.

Estimated coho encounters in commercial fisheries relevant to the PST were: seine – 9524; gill net – 6427; and troll – 23167.

Recreational Fisheries

For recreational fisheries, there was non-retention of wild coho in the mixed stock areas of southern BC. In addition, the use of barbless hooks was mandatory.

In 2002, a gradual expansion of hatchery mark selective fisheries (SMF) continued. Coho SMF were implemented in most of southern BC, including the Johnstone Strait area (Statistical Areas 12 and part of 13), the Strait of Georgia (Areas 13-19, 28, 29), Juan de Fuca Strait (Statistical Areas 19-20), and the WCVI (Statistical Areas 121-126). Selective hatchery mark fisheries for coho were implemented in these areas from August 1 through December 31.

In terminal areas the SMF started as early as June 1, including the Sechelt area (selected portions of Areas 16-1, 16-5, 29-1; Davis Bay, Porpoise Bay, Halfmoon Bay, Chapman Creek terminal areas), Burrard Inlet (Capilano River) and terminal portions of the WCVI.

Some terminal areas included retention of wild coho. Hardy Bay in Area 12 was open to retention of hatchery or wild coho (1 per day) for a short period. On the WCVI (Areas 23, 24, 25) daily limits, as of June 1, were 2 coho only one of which could be wild. In northern Alberni Inlet, retention of four coho was permitted, of which one could be wild. Wild coho retention was also permitted inside Port San Juan (Area 20-2) starting mid September.

There was a sport fishery in the Big Qualicum and Puntledge Rivers (Stat. Area 14) during October-November. The fishery was monitored using a roving creel survey

design combined with on-ground angler effort counts. Catch of marked coho in the Big Qualicum (to Nov. 12) was estimated to be 1894 with releases of wild coho at 3250. Catch in the Puntledge River (to Nov. 17) of marked coho was estimated to be 836 while releases of wild coho were 3017.

Catch estimates

Coho catch, releases, and mark rates are derived from three main sources; creel survey, guide logbook and test fishing information. It was assumed that test fishing data should provide the most unbiased mark rate information. Both creel survey and guide logbook mark rate data are likely biased low. This likely occurs because although catch data may be quite accurate, the coho unmarked released data may be overestimated.

The total number of hatchery coho kept was estimated to be approximately 15,000 with another 11,000 wild coho kept in terminal area fisheries.

Although all of Georgia Strait was open for coho mark only retention in 2002 compared with only statistical areas 13 and 14 in 2001, hatchery coho catch was down by 63% and releases of wild coho down by 78%. In Juan de Fuca Strait, the SMF expanded in time from mid September in 2001 to August 1 in 2002, and both catch of hatchery coho and releases of wild coho increased 10 times over 2001 levels.

Catch in the Sechelt area of Georgia Strait (Area 16) was comparable to last year (increase of 5%) and fishers commented that coho were aggressive towards fishing gear when they first arrived in the area but were difficult to catch after that.

Overall encounter rate for coho in Georgia Strait was less than in 2001 (24% reduction), with the majority recorded in the Victoria area. Mark rates recorded in the creel survey averaged 34% over all areas in Georgia Strait and mark rates based on guide logbook was 36% for Georgia Strait and 45% off WCVI, while test fishing results indicated a 34% mark rate (in Area 20 only).

Although the overall number of participants in the guide logbook program was up from last year (increased 26%), data retrieval was considerably less than in 2001. This year only 53% of the guides that were contacted and given a logbook provided information for us. The Vancouver area had the poorest participation level at less than 10% while Victoria had the best at greater than 90%.

Table 4. Total 2002 encounters of coho and estimated post-release mortalities during coho total non-retention and Selective hatchery mark only fisheries.

Area	Survey Dates	Effort (Boat trips)	Legal Size					Sub-legal Size	
			Hatchery		Wild			Hatchery	Wild
			Kept	Release	Kept	Release	Total Mortality	Release	Release
Prior to Selective Hatchery Mark Fishery									
23, 124	June 1-July 31	5,665	63	122	66	8,189	885	0	4,679
125, 126	June 1-July 31	19	8	0	9	53	14		
23A	June 1-July 31	15,291	0		0		0		
26	June 1-July 31	531	5	12	5	950	100	0	5
GST	Apr. 1-July 31	88,398	115	2,012	86	2,769	363	1,410	2,677
JDF	Jan. 1-July 31	41,482	57	1,712	35	3,752	410	69	4,826
sub-total		151,386	248	3,859	201	15,712	1,772	1,479	12,187
Selective Mark Fishery									
123, 124	Aug. 1-Sept. 30	3,336	1,722	380	95	3,716	467	0	25
125, 126	Aug. 1-Sept. 30	344	68	0	129	168	146		
23B, 24, 25	June 1-Sept. 30	26,398	4,911	1,512	9,690	5,141	10,204	23	1,459
26	Aug. 1-Sept. 30	301	122	348	12	610	73		
GST	Aug. 1-Oct. 31	76,196	4,152	537	109	9,251	1,034	258	8,473
JDF	Aug. 1-Dec. 31	20,898	2,918	408	370	6,237	994	0	2,158
Terminal GST 14, 16, 29	June 1-Dec. 31	6,090	975	506	0	1,002	100		
sub-total		133,563	14,867	3,690	10,405	26,125	13,017	281	12,114
TOTALS:		284,949	15,115	7,549	10,606	41,837	14,789	1,760	24,301

Overview of Coho Stock Status

West Coast of Vancouver Island, excluding Quatsino Inlet (Area 27)

There are fixed site counts at Stamp Falls and Carnation Creek, both in Area 23. About 80% of the Stamp Falls coho are from releases by Robertson Creek Hatchery. This year's escapement to the hatchery is two thirds of last year but about equal to the five year average. Since releases changed little and catches were not substantially larger, the lower escapement indicates that ocean survival decreased from 2001, as forecast. Conversely, the escapement of the wild stock at Carnation Creek was the largest seen in the 32 year time series and was over twice the five year average.

This relatively large escapement to the WCVI wild indicator stock at Carnation is not reflected in the preliminary counts from other WCVI streams. These stocks are

assessed by walk or swim and only peak counts are available at this time. Those counts are about two thirds the peak counts in 2001 and about a half of peak counts averaged over the last five years. One large stock assemblage is San Juan (Area 20), where escapements were substantially less than the large escapement in 2001. There is no regional pattern to the escapements relative to past years. Low counts were not related to poor counting conditions - counting efficiency was probably better this year than last.

Overall, the status of WCVI coho as indicated by fry, smolts and adults was good in 2002. With the exception of the main wild indicator, escapements are not as good as some recent years, but no trends are apparent that would suggest a conservation concern. Smolt migrations in the spring from the three wild indicators that have prior data were all above average. These indicators are in Area 20 (Kirby Cr.) and Area 23 (Carnation and Cherry creeks). Fry densities in August and September were generally healthy throughout this region.

Areas 14-19 in Georgia Basin

Using peak counts of observed coho to date, escapements are about 60% of last year's peak counts on the mainland and average 80% and 110% of last year's counts in Areas 14 and 17 on Vancouver Island. Vancouver Island escapements are about equal to the five year average but mainland escapements are only 60% of the average. The Black Creek escapement in Area 14 is approximately 4,500. This has exceeded the target of 3,150 despite a very poor brood year escapement in 1999. There have been two escapements larger than 2002 since 1997 and three were less. The escapement to Chase River, in Nanaimo is about 75% of last year; Englishman River escapements are much worse however – down to near 1,000 from 8,000. It is too early to report on stocks in Area 18 (Cowichan).

Hatchery escapements, which are indicative of marine survival under the current low exploitation, are also showing a similar pattern to wild stocks. Quinsam and Big Qualicum escapements to date are 70% and 90% of last year but the escapement to Lang, near Powell River, was only 33% of last year. The Quinsam escapement is average for the last five years; the Big Qualicum escapement is about 30% better than average. Note, however, that these five year averages represent very poor marine survival. Even so, the Lang escapement was only 40% of the five year average. Goldstream Hatchery, near Victoria, has had an extremely poor coho escapement, representing less than 1% survival to escapement. It will be important to assess spawners in the Cowichan area, near Goldstream.

Overall, escapements in this region are apparently less than last year and Area 14 and 17 stocks on Vancouver Island are near the five year average overall. This average spans a period of poor status for these stocks and furthermore escapements to mainland streams appear to be worse relative to last year and the last five years. Early indications are negative for SE Vancouver Island (Areas 18 and 19). Notwithstanding the improvement shown at Black Creek compared to its brood year, the overall status of coho in this region is guarded. Escapements are adequate but stocks show little sign of being able to withstand significant increases in exploitation.

Smolt abundances in monitored streams were good in 2002, most being at least 40% above recent averages. The fry progeny of the good escapements in 2001 were

abundant in 2002, although there was evidence that mortality was high, i.e. fry densities did not increase in proportion to the increase in escapement – evidence that 2001 escapements may have exceeded optimum with respect to fry production. The problem remains ocean survivals, which are too low to accommodate significant extra mortality in the form of fishing mortality.

Johnstone Strait / Mainland Inlets

The coho PST indicator stream for the Johnstone Strait mainland inlets is Heydon Creek (Loughborough Inlet). At present the migration of adult coho into the Heydon system continues. By the end of October the total count for coho had exceeded the average return, with continued burst migration following the rain events occurring in November. With the implementation of a stable fence structure in the Heydon system in 2001, assessment of coho escapement has improved over the previous three years of the program. Continued procedural improvements to establish escapement techniques on this system will allow us to assess coho stock status with greater accuracy.

The Johnstone Strait coho stock status indicator the Keogh River showed an increased escapement this year, indicating higher marine survival in comparison to the past few years. The higher escapement values are indicative of above average coho smolt output in the brood year 2000. The escapement was an increase to 2000 and 2001, but not reaching the 1998 record escapement.

Southern B.C. Chum Salmon

Johnstone Strait Fisheries (Areas 12 and 13)

Due to the variation in chum returns over the years a new strategy of Study area chum management was initiated in Johnstone Straits in 2002. In order to ensure sufficient escapement levels while providing more stabilization of the fisheries a 20% fixed exploitation rate strategy was implemented independent of run size. Fisheries were conducted based on allocation of the 20% across the user groups of which 15% was allocated to the commercial gear groups. The additional 5% was set aside to satisfy FSC, recreational, test fish requirements and provide a buffer to the commercial exploitation. Past tagging studies conducted in 2000 and 2001 helped in the development of this strategy in assessing the exploitation rate and migration timing of chum stocks in the Straits. Another tagging study was also conducted in 2002 but analysis of the data is not yet complete.

The pre-season forecast suggested a study area chum run size in the range of 3.5 million to 7 million. In-season information is still being collected and analyzed in regards to final run size estimation and harvest rates. Test fishing commenced on September 17 and was terminated on November 4th.

Johnstone Strait study area chum fisheries for commercial seine, gillnet and troll were conducted between October 2 and November 7. The catch results as follow:

Two seine fishery openings were conducted, the first on Oct 2 (12 hrs) and the second on Oct 21 (10 hrs) estimated total catch 521,000 chum.

Six gillnet fishery openings were conducted between Oct 6 and Nov 7, estimated total catch - 95,000 chum

Six troll fishery openings were conducted between Oct 7 and Nov 7, estimated total catch - 32,000 chum

The total commercial fishery chum catch (including 27,000 selective fishery catch) from the Johnstone Strait study area is 648,000. In addition, test fishery payment catches totaled 40,500, First Nation harvest is estimated at 13,000 and the recreational catch is estimated at 15,000. The total estimated harvest from the Johnstone Strait area is estimated at 716,500 chum.

Strait of Georgia (Areas 14 to 19)

Preseason expectations in general suggest surpluses for most terminal area, especially Mid-Vancouver Island areas and Saanich Inlet (Goldstream River). In-season management commenced in mid-October. The preseason expected return to the Mid-Vancouver area was estimated to be 709,000. Catches in Johnstone Strait and escapement goals (310,000) left a substantial terminal surplus available for harvest. Fisheries in Mid-Vancouver Island area occurred with gillnet starting October 15-17, 21-23, 25-27, 29-31 and November 16-22. Gillnet catches totaled approximately 110,000. Troll fisheries occurred on October 15-17, 21-26, 29-31 and November 17-22. Troll catches are estimated to total 1,600. Seine fisheries occurred October 28 and November 17-22 with catches totaling 113,000. Commercial catches for all gear types totaled approximately 225,000.

A two-day gillnet fishery occurred in Nanaimo area on November 12-14 which resulted in a catch of 200 chum. In addition a troll fishery occurred on November 12-14 which resulted no observed effort.

Gillnet fisheries in Area 18 (Cowichan) occurred October 15-17, November 16-22 (Cowichan and Goldstream) for a total of 6,400 chum. Seine fishing in Cowichan and Goldstream areas occurred on November 14-16 and 19-20, with a catch totaling 248,000. Troll fishing occurred October 15-17 (Cowichan) and on November 16-22 (Cowichan and Goldstream). The total catch for troll was less than 100. In addition, First Nation commercial fisheries (ESSR - Excess Salmon to Spawning Requirements) occurred between November 9-20 (Goldstream) harvesting 75,000 and on November 18-18 (Cowichan) harvesting 11,000 chum Note that catches in terminal areas may change as fisheries and management are currently in progress.

Stock Identification Sample Collection

Traditional Genetic Stock Identification samples were not collected this year. However, baseline DNA samples were collected from several streams with the Inside southern British Columbia area.

Fraser River

Chum test fishing at Albion began on September 1 and was conducted on alternate days (alternated with the chinook test net) until Oct. 20 when chinook test fishing was completed; chum test fishing then continued on a daily basis. Chum catches in

the 6.75" mesh chum test net to November 18 totaled 13,103 chum. As of November 18 the preliminary run size estimate predicted by the Bayesian model first used in 2000 was 1.9 million. This is below the pre-season expectation that was based largely on the record 3.2 million return in 1998. To November 17 fisheries by First Nations caught 52,427 chum of which approximately 17,000 were taken in selective beach seine fisheries. Catch estimates are based on hails and Aboriginal landing slips. Additional First Nation fisheries are still being scheduled. Two Area 29 commercial gillnet fisheries, on October 21 and November 7, had catches of approximately 30,000 and 5,000, respectively.

West Coast Vancouver Island Net (Areas 21 and 22)

Preseason expectations for this system were forecast at 711,000 chum. The overall gross escapement goal into Nitinat Lake ranges between 250,000 to a maximum of 350,000. The additional 100,000 above the 250,000 target are utilized as hatchery brood stock requirements, increased distribution of spawners in the Nitinat River, and payment for in-lake test fishery/brood stock capture activities. Chum salmon returning to Area 22 (Nitinat Lake) are caught in Area 21 and parts of Areas 20 and 121. The fishing plan is based on achieving weekly escapement goals into Nitinat Lake. In addition, the fishing plan includes requirements to minimize by-catch of passing coho and steelhead. The harvest plan provides early opportunity for gillnet, provide a seine fishery to balance allocation, and then allow a combined seine and gillnet fishery at the peak of the run. Implemen ation of the plan is based on weekly assessment information from an in-lake gill net test fishery and escapement surveys, and a seine test fishery outside Nitinat Lake.

Seine test fishing commenced outside Nitinat Lake on September 30. Based on preseason expectation of substantial surpluses to the area, early gill net fisheries were planned. Gillnet fisheries occurred on October 1-12 and October 15-28 resulting in catches totaling 81,000. Seine fishing occurred on Oct 13-28 and resulted in a catch of 473,000. At this time, estimates of escapement to the lake were on track with preseason expectations. However, a major lake upwelling of un-oxygenated water occurred, which killed substantial numbers of chum waiting to spawn. All commercial fishing was then halted (October 28) and preliminary assessment confirmed a substantial mortality. The extent of chum mortality and resulting viable escapement are currently still being assessed. The Nitinat Hatchery took 32 million eggs (target 30-45 million).

Preliminary 1993 to 2002 Catches in Canadian Treaty Limit Fisheries

Fisheries/Stocks	Species	2002#	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991
Stikine River	Sockeye	17,294	25,600	27,468	38,055	43,803	65,559	74,281	53,467	45,095	47,197	26,284	22,763
(all gears)	Coho	82	233	301	181	726	401	1,404	3,418	3,381	2,616	1,855	2,648
	Chinook-large	1,362	1,480	3,086	2,916	2,164	4,483	2,471	1,646	1,790	1,803	1,840	1,511
	Chinook-jack	578	103	628	1,264	423	286	421	860	350	308	239	660
Taku River	Sockeye	31,053	47,660	28,009	20,681	19,038	24,003	41,665	32,640	28,762	33,217	29,472	25,067
(commercial gillnet)	Coho	3,082	2,568	4,395	4,416	5,090	2,594	5,028	13,629	14,531	3,033	4,077	3,415
	Chinook-large	1,561	1,458	1,576	908	1,107	2,731	3,331	1,577	2,065	1,619	1,445	1,177
	Chinook-jack	291	118	87	257	227	84	144	298	235	171	147	432
Areas 3 (1-4)*	Pink	876,631	473,318	*127,000*	2,162,280	61,000	329,000	987,000	2,613,000	262,000	1,242,000	1,099,000	6,961,000
(commercial net)													
Area 1	Pink	41,418	175,000	28,295	25,000	0	261,000	732,000	1,284,000	220,000	890,000	760,000	1,647,000
(commercial troll)													
North Coast**	Chinook	136,048	43,500	32,048	70,701	144,650	145,568	26,900	119,100	241,000	258,300	262,000	303,200
(troll + sport)													
West Coast Vancouver	Chinook sport	22,009	36,474	37,200	31,100								
Island	Chinook troll	128,798	54,770	*63,400*	6,500	10,284	51,400	0	81,000	146,000	275,000	345,500	202,900
Fraser River (Canadian	Sockeye	2,182,700	295,000	953,000	54,000	1,295,000	8,737,000	1,019,000	903,000	9,800,000	13,428,000	3,906,000	6,947,000
commercial catch)	Pink	0	579,000		3,000	0	3,660,000	0	3,777,000	0	3,731,000	0	6,405,000
Fraser River Stocks	Sockeye	434,600	240,000	494,000	41,000	707,000	1,578,000	257,000	415,000	2,100,000	2,876,000	700,000	1,881,000
(US commercial catch)	Pink	0	427,000		3,000	0	1,565,000	0	1,919,000	0	1,725,000	0	2,789,000
West Coast Vancouver	Coho	0	0	0	0	0	0	761,000	1,345,000	1,251,000	954,000	1,664,000	1,890,000
Island (commercial troll)													
Johnstone Strait	Chum	700,000	236,000	161,000	41,411	1,820,000	104,593	101,971	269,000	1,295,600	1,271,700	1,368,283	174,269
(clockwork catch)***													

\# 2002 catches are preliminary and are based on in-season hails, on-the-grounds counts, dockside tallies and Aboriginal landing slips, fish slip data, creel surveys and logbooks

* Area 5-11 catches included prior to 1995 and excluded from 1995 to 1998 inclusive. Not part of 1999 Annex IV provisions.

** North Coast catch excludes terminal exclusion catches of 6,000 ('91), 6,100 ('92), 7,400 ('93), 6,400 ('94), 1,702 ('95), 16,000 ('96), 5,943 ('97), and 2,182 in 1998. No terminal exclusion in the 1999 agreement covered under the AABM arrangement. Central Coast areas not part of 1999 Annex Iv provisions.

*** Canadian clockwork catch includes commercial, IFF and test fish catches in Areas 11-13 for 1991-94 inclusive, and in Areas 12-13 for 1995 to 2002 inclusive.

Note: bold line between 1998 and 1999 indicates that 1999 catches are reported according to fisheries/stocks under the 1999 Annex IV provisions.

C. 2002 POST-SEASON REPORT FOR UNITED STATES SALMON FISHERIES OF RELEVANCE TO THE PACIFIC SALMON COMMISSION

Northern Boundary Area Fisheries

District 104 Purse Seine Fishery

The June 30, 1999 revision of the Pacific Salmon Treaty Agreement calls for the implementation of abundance based management in the District 104 purse seine fishery. The agreement allows the District 104 purse seine fishery to harvest 2.45 percent of the Annual Allowable Harvest (AAH) of Nass and Skeena sockeye prior to statistical week 31. The AAH is calculated as the total run of Nass and Skeena sockeye salmon minus either the escapement requirement of 1.1 million (200,000 Nass and 900,000 Skeena) or the actual inriver escapement, whichever is less.

The District 104 purse seine fishery opens the first Sunday in July; in 2002 the initial opening was July 7 (Week 28) The pre-Week 31 fishing plan for District 104 was based on the Canadian Department of Fisheries and Oceans (DFO) preseason forecast returns of 686,000 Nass and between 800,000 to 1.2 million Skeena sockeye salmon. The preseason forecasts result in a total projected return of between 1.59 and 1.89 million with a resulting AAH of between 486,000 and 786,000. Using this forecast, the pre-Week 31 allowable harvest is a minimum of 11,900 Nass and Skeena sockeye salmon. Preliminary indications are that the actual return of both Nass and Skeena River sockeye were higher than forecast which would result in an increase in the AAH.

In the 2002 treaty period, 26,554 sockeye were harvested in five openings totaling 72 hours.(Table 1). In general, the number of purse seine vessels fishing in District 104 was low this year. Total vessels fell from 32 in the initial opening, to 17 in the final opening during the period covered by the Treaty. This is a substantially lower number of vessels that in past years. The sockeye harvested during this period have historically averaged 60% to 80% Nass and Skeena origin.

The fleet moves freely between districts, so seining opportunities elsewhere can affect the catch and effort in District 104. Shorter fishing time allowed in the initial openings in District 104, as well as poor catches in that fishery throughout the season, resulted in increasing numbers of boats leaving to fish elsewhere as the season progressed.

The average number of days and boat-days fished pre-Week 31 in District 104 is down 56% and 78% compared to the 1980-1984 period respectively (Table 2). The corresponding sockeye harvest is also down 26% despite a 281% increase in the average sockeye catch-per-boat-day since 1980 through 1984.

In the post-Treaty portion of the season beginning in Week 31 the District 104 purse seine fishery was initially opened the same dates and hours as openings in Districts 101 and 102; openings were on a two-day-on and two-day-off schedule from July 28 though August 5. Catches of pink, sockeye and chum salmon continued to be poor resulting in relatively few boats fishing District 104 and their number continued to drop throughout the season as effort moved to inside waters where catches were better. By mid-August fewer than 10 purse seine vessels were fishing in District 104. From late August

through September 2, District 104 was open for several 15-hour periods and one 39-hour period but no purse seine vessels fished in the district after August 25.

In 2002 the District 104 purse seine fishery harvested 838 thousand pink salmon, 75 thousand chum, 34 thousand sockeye, 16 thousand coho, and 1.2 thousand chinook salmon. These catches of sockeye, pink, and coho salmon are the lowest recorded since the late 1970's. Low catches of all species in the District 104 purse seine fishery may have been due to a change in migratory routing since the catch in other Alaskan and the Canadian fisheries was good and both the Nass and Skeena sockeye runs were larger than forecast.

Table 1. Catch and Effort in the Alaska District 104 purse seine fishery by opening, 2002.

Week/ Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
28	7-Jul	0	5,687	1,446	25,304	9,415	32	12
29	14-Jul	0	4,520	2,100	10,485	5,364	22	15
29B	18-Jul	0	5,896	1,958	31,194	7,175	20	15
30	21-Jul	229	5,657	2,470	40,927	6,870	20	15
30B	25-Jul	242	4,794	1,338	42,888	4,649	17	15
31	28-Jul	510	4,009	1,663	61,821	8,672	16	39
31B	1-Aug	159	665	1,033	58,912	2,464	8	39
32	5-Aug	20	426	356	33,396	2,369	4	39
32B	9-Aug	9	1,403	1,412	200,263	10,348	13	43
33	11-Aug	7	418	601	123,733	6,671	12	44
33B	13-Aug	1	243	590	88,286	4,197	8	87
34	18-Aug	0	100	197	53,276	3,723	3	87
34B	23-Aug	0	38	298	38,290	1,805	3	42
35	25-Aug	2	331	257	29,241	1,496	4	45
35B	28-Aug	0	0	0	0	0	0	15
35C	29-Aug	0	0	0	0	0	0	15
35D	30-Aug	0	0	0	0	0	0	15
35E	31-Aug	0	0	0	0	0	0	15
36	2-Sep	0	0	0	0	0	0	39
Total Weeks 27-30		471	26,554	9,312	150,798	33,473		72
Total Weeks 31-46		708	7,633	6,407	687,218	41,745		564
Total Season		1,179	34,187	15,719	838,016	75,218		636

Table 2. Fishing opportunity, effort, and sockeye harvests prior to Week 31 in the District 104 purse seine fishery, 1980 to 2002.

Year	Hours Fished	Fraction Days Fished (1d=15hr)	Boat Days Fished	Sockeye Harvest	Sockeye Catch/ Boat-Day
1980	207	13.8	2,877	266,273	93
1981	132	8.8	1,108	185,188	167
1982	117	7.8	1,435	213,150	149
1983	108	7.2	1,211	168,806	139
1984	132	8.8	805	103,319	128
1985	84	5.6	502	100,590	200
1986	108	7.2	968	91,320	94
1987	90	6.0	457	72,385	158
1988	108	7.2	994	248,789	250
1989	84	5.6	438	157,566	360
1990	42	2.8	276	169,943	615
1991	41	2.7	243	98,583	406
1992	29	1.9	142	79,643	561
1993	45	3.0	343	163,189	476
1994	55	3.7	202	158,524	783
1995	58	3.9	218	71,376	328
1996	31	2.1	128	215,144	1,684
1997	56	3.7	409	572,942	1,402
1998	32	2.1	89	17,394	196
1999	30	2.0	44	7,664	174
2000	81	5.4	192	48,969	255
2001	50	3.3	182	203,090	1,115
2002	72	4.8	124	26,554	215
Avg. 80-84	139	9.3	1,487	187,347	135
Avg. 85-02	61	4.1	331	139,093	515
% Change	-56%	-56%	-78%	-26%	281%

District 101 Drift Gillnet Fishery

The District 101 (Tree Point) drift gillnet fishery is also abundance based management. The agreement specifies a harvest of 13.8 percent of the AAH of the Nass sockeye run. For the 2002 season, DFO forecast a total run of 686,000 Nass River sockeye salmon. The AAH is calculated as the total run of Nass sockeye salmon minus either the escapement requirement of 200 thousand or the actual inriver escapement, whichever is less.

The District 101 drift gillnet fishery opens by regulation on the third Sunday in June. During the early weeks of the fishery, management is based on the run strength of Alaska wild stock chum and sockeye salmon and on the strength of the Nass River sockeye salmon. Beginning in the third week of July, when pink salmon stocks begin to enter the fishery in large numbers, management emphasis shifts by regulation to that species. By regulation, the District 101 Pink Salmon Management Plan sets gillnet

fishing time in this district in relation to the District 101 purse seine fishing time when both fleets are concurrently harvesting the same pink salmon stocks.

The District 101 gillnet fishery was initially opened Sunday June 16 (Week 25) for a 4-day fishery followed by a 3-day opening in Week 26, 4-days in Week 27 , 3-days in Week 28, and 3-days in Week 29. In Week 30 (July 21) the Pink Salmon Management Plan was implemented resulting in the District 101 gillnet fishery being opened 4-days. Sockeye and coho harvests during these early openings were above average while chum harvest was below average. Poor chum catches resulted in some reduction in fishing time. The cumulative sockeye harvest prior to the initiation of the Pink Salmon Management Plan was in Week 30 was 104,626 fish, or about 87% of the season's total sockeye harvest. Nass River sockeye salmon apparently returned at numbers higher than the 686,000 forecast by DFO.

The fishery was managed according to the Pink Salmon Management Plan from Week 30 through Week 36. During this time the gillnet fishery was opened for 4-days in Week 30, followed by 5-day openings each week through Week 35, and a 4-day opening in Week 36. During this time the effort (boats-days) was well below Treaty averages as were the sockeye, chum, and coho salmon harvests.

Starting on September 8 (Week 37) and continuing through the close of the fishery on September 25 (Week 39), the fishery was managed on the strength of the fall chum and coho returns. Chum and coho harvests were below Treaty averages these weeks. The below average catches are more a reflection of the reduced effort at Tree Point in 2002, as coho escapements were generally good throughout Southeast Alaska and Northern B.C..

A total of 120,353 sockeye salmon were harvested in the District 101 drift gillnet fishery in 2002 (Table 3). The sockeye harvest and number of boat-days and boats fished was below the 1985-2001 average and the days fished was above average. The number of boats fishing annually since the Treaty was signed has dropped from a high of 198 in 1986 to 76 in 2002. The final number of Nass River sockeye harvested at Tree Point will not be available until catch, escapement, and stock composition estimates are finalized for the 2002 season.

Table 3. Weekly catch and effort in the Alaska District 101 commercial drift gillnet fishery, 2002.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days
25	16-Jun	137	13,883	94	12	1,112	57	4
26	23-Jun	69	9,954	112	12	1,339	53	3
27	30-Jun	204	42,006	1,353	7,229	26,584	53	4
28	7-Jul	131	29,799	2,629	7,427	17,350	59	3
29	14-Jul	102	8,620	1,705	20,222	22,261	60	3
30	21-Jul	85	7,393	2,147	28,452	11,839	46	4
31	28-Jul	73	3,032	2,331	104,201	17,508	41	5
32	4-Aug	19	3,507	3,779	78,701	8,810	39	5
33	11-Aug	7	1,314	2,086	102,405	10,959	36	5
34	18-Aug	0	577	1,584	115,140	7,212	32	5
35	25-Aug	1	158	2,656	32,437	8,078	24	5
36	1-Sep	0	74	4,125	14,200	6,181	21	4
37	8-Sep	0	27	3,944	1,973	3,799	17	4
38	15-Sep	0	9	3,720	121	1,374	14	3
39	22-Sep	0	0	1,251	4	514	12	3
Total		828	120,353	33,516	512,536	144,920	76[1]	60

[1]This is the total number of individual boats that fished in District 101 in 2002.

Table 4. Annual sockeye harvest in the Alaska District 101 drift gillnet fishery, 1985 to 2002, and comparison of sockeye harvest and effort (number of boats, hours, and boat-hours fished) between Statistical Weeks 26 and 35 when sockeye salmon are most abundant in this district.

		Catch and Effort Between Weeks 26 and 35			
Year	Annual Sockeye Harvest	Sockeye Harvest	Total Number of Individual Boats	Total Days Open	Boat-Days[2]
1985	173,100	159,021	153	43	4,422
1986	145,699	143,286	198	40	4,562
1987	107,503	106,638	170	25.6	2,671
1988	116,115	115,888	187	31.5	3,875
1989	144,936	130,024	176	42.6	4,894
1990	85,691	78,131	150	35	2,934
1991	131,492	123,508	130	41	3,336
1992	244,649	243,878	118	45	3,923
1993	394,098	390,299	148	43	4,284
1994	100,377	98,725	142	41	3,103
1995	164,294	151,131	128	42	3,438
1996	212,403	175,569	129	46	3,588
1997	169,474	152,662	128	42	3,403
1998	160,506	159,307	124	43.5	3,640
1999	160,028	158,268	118	43	3,351
2000	94,651	94,399	95	38	2,062
2001	80,041	62,129	76	42.5	1,953
Average 1985-2001	157,945	149,580	139	40.3	3,496
2002	120,353	106,360	76	42	1,772

[2]This is the sum of the individual weekly boat days.

Escapements

The 2002 pink salmon escapement indices had mixed results throughout SSE Alaska. Even though some stock groups did not reach the 1990-1999 averages, they were still above their minimum escapement goals. The District 101 pink salmon escapement index was 3.25 million fish, above the upper goal of 3.0 million. The District 102 pink salmon index escapement of 1.68 million fish was above the upper goal of 1.1 million pink salmon. The District 103 pink salmon index escapement of 3.14 million fish was above the upper goal of 2.55 million pink salmon. The District 105 pink salmon index escapement of 0.68 million fish was at the upper goal of 0.65 million pink salmon. The District 106 pink salmon index escapement of 0.60 million fish was within the goal range of 0.60 to 0.85 million pink salmon. The District 107 pink salmon index escapement of 0.56 million fish was just below the lower goal limit of 0.60 million pink salmon. When summed across Districts 101-108, escapement indices totaled 9.91 million, above the 6.0 – 9.0 million goal range for the southern Southeast Alaska sub-region.

Programs to estimate escapements of sockeye salmon were in place for nine systems in southern Southeast Alaska in 2002, Hetta, Hugh Smith, Luck, Klawock, McDonald, Salmon (Karta), Salmon Bay (N. Prince of Wales), and Thoms Lakes. All estimates at this time are preliminary. The sockeye escapement to Hetta Lake was 2,547 ± 199, based on mark-recapture counts. The sockeye escapement to Hugh Smith Lake was 6,133 ± 429, based on mark-recapture counts. The sockeye escapement to Luck Lake was 16,000 ± 1,200, based on mark-recapture counts. Klawock Lake had a preliminary weir count of 13,991 with a total escapement based on mark-recapture counts not completed at this time. The escapement of sockeye salmon into McDonald Lake was estimated to be 25,776 based on the expanded foot survey index. Salmon Lake escapement was estimated at 7,624 based on the expanded foot survey index. Salmon Bay Lake escapement was estimated at 44,000 ± 10,000 based on mark-recapture counts. Thoms Lake escapement was estimated at 6,000 ± 650 based on mark-recapture counts.

Escapements of summer and fall run chum salmon were generally well distributed throughout southern Southeast Alaska. Index escapement counts were 53.4% below the 1990-2000 average. This low escapement was partially attributed to lack of surveys during the peak timing due to poor weather. The escapement of chum salmon into Fish Creek at the head of Portland Canal was estimated to be 13,022 based on expanded foot survey counts; this is below the 10-year average.

Transboundary Area Fisheries

Stikine River Area Fisheries

The 2002 harvest in the District 106 commercial gillnet fishery included 446 chinook, 56,135 sockeye, 226,277 coho, 82,951 pink, and 112,541 chum salmon (Table 5). District 106 catches of chinook, sockeye, pink, and chum salmon were well below the 1992-2001 average, while the 2002 catches of coho were higher than the 10 year average. Lower catches can be partially attributed to low effort in the district. An estimated 32% of the coho salmon harvest was of Alaskan hatchery origin. The U.S./Canada joint Tahltan and Tuya fry-planting projects contributed an estimated 679 fish to the District 106 sockeye catch.

Table 5. Weekly salmon catch in the Alaskan District 106 commercial drift gillnet fisheries, 2002. Catches do not include Blind Slough terminal area harvests.

Statistical Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	16-Jun	136	3,382	1,469	18	1,471	55	2	110
26	23-Jun	48	3,625	1,602	12	3,170	50	2	100
27	30-Jun	49	7,362	5,272	1,558	9,982	63	2	126
28	7-Jul	68	10,621	10,846	2,034	12,829	74	2	148
29	14-Jul	22	11,744	11,275	1,852	12,710	72	2	144
30	21-Jul	17	6,790	9,027	4,855	9,600	72	2	144
31	28-Jul	37	5,528	7,818	6,019	9,873	61	2	122
32	4-Aug	34	3,555	9,319	13,397	4,928	42	2	84
33	11-Aug	1	1,833	11,248	24,271	6,215	57	3	171
34	18-Aug	8	1,227	15,981	19,842	7,253	80	3	240
35	25-Aug	3	218	13,432	4,909	3,966	65	3	195
36	1-Sep	8	190	40,552	3,909	12,713	83	3	249
37	8-Sep	3	48	33,750	266	7,973	80	4	320
38	15-Sep	4	9	23,096	7	5,794	70	4	280
39	22-Sep	8	3	18,176	2	3,045	45	3	135
40	29-Sep	-	-	10,709	-	866	25	3	75
41	6-Oct	-	-	2,473	-	149	11	3	33
42	13-Oct	-	-	232	-	4	3	2	6
Total		446	56,135	226,277	82,951	112,541	154	47	2,681
1992-2001 Avg.		911	177,953	203,811	421,324	248,430		43	3,802
2002 % 10-yr Avg.		49.0%	31.5%	111.0%	19.7%	45.3%		109%	69.2%

In the District 108 fishery, 25 chinook, 208 sockeye, 21,131 coho, 4,578 pink, and 2,017 chum salmon were harvested (Table 6). District 108 was not opened until week 31 due to concerns related to Tahltan Lake sockeye salmon. Because the fishery was delayed, comparisons of 2002 chinook and sockeye salmon harvests to previous 10-year averages are of little value. An estimated 7% of the coho catch was of Alaskan hatchery origin. The U.S./Canada joint Tahltan and Tuya Lake fry-planting projects did not contribute any sockeye salmon to the District 108 catch.

Table 6. Weekly salmon catch and effort in the Alaskan District 108 commercial drift gillnet fishery, 2002. Catches do not include Ohmer Creek terminal area harvests. The permit days are not adjusted for boats that did not fish the entire opening.

Statistical Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
31	28-Jul	2	77	150	845	525	4	2	8
32	4-Aug	6	63	490	1,819	620	7	2	14
33	11-Aug	-	30	505	565	126	7	3	21
34	18-Aug	1	12	985	917	35	5	3	15
35	25-Aug	11	9	3,620	204	40	16	3	48
36	1-Sep	4	16	8,123	184	365	20	3	60
37	8-Sep	1	1	3,966	44	109	21	4	84
38	15-Sep	-	-	2,256	-	169	13	4	52
39	22-Sep	-	-	713	-	17	5	3	15
40	29-Sep	-	-	323	-	11	2	3	6
41	6-Oct	-	-	-	-	-	-	3	0
42	13-Oct	-	-	-	-	-	-	2	0
Total		25	208	21,131	4,578	2,017	43	47	323
1992-2001 Avg.		1,412	64,040	18,502	39,294	50,180		53	1,540
2002 % 10-yr Avg.		2.3%	0.4%	114.5%	11.7%	5.2%		71.6%	18.2

Harvest sharing of Stikine sockeye stocks is based on in-season abundance forecasts produced by the Stikine Management Model (SMM) (Table 7). The marine and inriver catches of planted Tuya fish were estimated from analysis of otoliths for thermal marks. Egg diameter analysis of inriver catches was used to estimate the relative abundances of Tahltan and Mainstem fish to Tuya fish in the Stikine River. The historical average weekly stock compositions were used to estimate the harvests of Tahltan and Mainstem Stikine sockeye stocks. Based on these analyses and ratios, the Sumner Strait fishery (Subdistricts 106-41 & 42) harvested 5,649 Stikine sockeye salmon, 14.5% of the total sockeye harvest in those Subdistricts. The Clarence Strait fishery (Subdistrict 106-30) harvested an estimated 1,057 Stikine fish, 6.2% of the harvest in that subdistrict. It is estimated that the District 108 fishery harvested 80 Stikine fish, 38.5% of the total sockeye harvest in that area. An estimated 6,786 Stikine sockeye salmon were harvested in commercial gillnet fisheries from both districts, representing 12% of the total sockeye catch. Of these Stikine sockeye salmon, an estimated 679 fish were produced by the joint U.S./Canada fry-planting projects on the Stikine River.

Preliminary postseason run reconstruction estimates (Table 8) differ from the in-season management model estimates.

Table 7. Weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as determined inseason by the Stikine Management Model, 2002.

Stat. Week	Start Date	Forecasts		TAC		Cumulative Catch	
		Run Size[a]	TAC	U.S.	Canada	U.S.	Canada[b]
25	16-Jun	79,600	9,783	4,892	4,892	758	0
26	23-Jun	79,600	9,783	4,892	4,892	1,536	1,037
27	30-Jun	79,600	9,783	4,892	4,892	3,530	2,847
28	7-Jul	135,346	69,196	34,598	34,598	5,134	4,079
29	14-Jul	119,803	49,494	24,747	24,747	5,826	5,899
30	21-Jul	128,137	59,287	29,643	29,643	6,180	13,745
31	28-Jul	127,794	53,698	26,849	26,849	6,639	16,882
32	4-Aug	117,034	43,755	21,878	21,878	6,787	17,193
33	11-Aug	111,586	37,748	18,874	18,874		

[a] U.S. forecasts were as follows: the preseason forecast was used for weeks 25, 26, and 27; the inriver test fishery CPUE data for the remainder of the sockeye season. (Canada independently generates forecasts that may use different criteria in some weeks.)

[b] Cumulative catch for Canada does not include approximately 2000 Tuya ESSR fishery catch.

The estimated Stikine sockeye run was 91,445 fish (Table 8). The estimated spawning escapement of sockeye salmon past Tahltan Lake weir was 17,532 fish, of which 3,051 were taken for broodstock and 400 for biological samples, this is below the desired point goal of 24,000 spawners. The estimated spawning escapement to the Stikine River mainstem was approximately 30,859 fish, which is slightly above the lower goal range of 30,000 fish.

Table 8. Preliminary run reconstruction for Stikine sockeye salmon, 2002.

	Tahltan	Tuya	Mainstem	Total
Escapement[a]	17,532	18,380	30,859	66,771
Broodstock	3,051			
ESSR[b] or Samples	400	2,000		
Spawning Escapement	14,081	16,380	30,859	44,940
Canadian Harvest				
Indian Food	3,278	2,106	598	5,982
Upper Commercial	319	214	59	592
Lower Commercial	3,066	1,688	5,865	10,619
Total	6,663	4,008	6,522	17,193
Test Fishery Catch	248	154	293	695
Inriver Run	24,443	22,542	37,674	84,659
U.S. Harvest				
106-41& 42	1,477	3,048	1,124	5,649
106-30	651	5	401	1,057
108	5	0	75	80
106 & 108 Test Fisheries	0	0	0	0
Total	2,133	3,053	1,600	6,786
Total Run	26,576	25,595	39,274	91,445
Escapement Goal	24,000	0	30,000	54,000
TAC	2,576	25,595	9,274	19,730
Canada TAC	1,288	12,797	4,637	18,722
Actual Catch[d]	6,663	4,008	6,522	17,193
% of TAC	517%	31%	141%	92%
U.S. TAC	1,288	12,797	4,637	18,576
Actual Catch[e]	2,133	3,053	1,600	6,786
% of TAC	165%	24%	34%	36%

[a] Escapement into terminal and spawning areas from traditional fisheries.
[b] Catch allowed in terminal areas under the Excess Salmon to Spawning Requirement license.
[c] Fish returning to the Tuya system are not able to access the lake where they originated due to velocity barriers.
[d] Does not include ESSR or test fishery catches.
[e] U.S. harvest estimate differs from Joint Interception Committee estimate because no estimates are made for catches. Does not include ESSR or test fishery catches other than in the listed fisheries.

The postseason estimates are likely to change when stock identification analyses are completed.

Taku River Area Fisheries

The District 111 commercial drift gillnet fishery salmon harvests totaled 1,850 chinook, 214,374 sockeye, 40,464 coho, 78,624 pink, and 231,966 chum salmon (Table 9). Catches of chinook, coho, pink and chum salmon were 62%, 65%, 63% and 77% of the ten-year (1992-2001) average, respectively. The catch of sockeye salmon was 151% of average. Enhanced stocks contributed significantly to the numbers of both sockeye and chums harvested, and minor numbers to the harvest of other species.

Table 9. Weekly salmon catch in the Alaskan District 111 commercial drift gillnet fishery, 2002.

Stat Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days[a]	Boat-Days
25	16-Jun	596	9,856	0	35	1,110	76	3	228
26	23-Jun	342	14,842	12	38	9,828	77	4	308
27	30-Jun	605	15,687	31	76	31,597	91	4	364
28	7-Jul	105	31,862	91	1,602	49,809	96	4	384
29	14-Jul	84	34,362	1,168	8,648	76,689	131	5	655
30	21-Jul	37	15,531	3,098	13,016	41,260	141	4	564
31	28-Jul	36	41,541	2,840	23,744	14,003	127	3	381
32	4-Aug	30	32,690	4,586	25,432	5,426	190	4	760
33	11-Aug	6	11,581	1,109	3,940	653	76	7	532
34	18-Aug	1	4,466	2,992	2,046	931	51	7	357
35	26-Aug	0	1,675	2,042	47	194	22	7	154
36	1-Sep	6	213	6,720	0	97	24	3	72
37	8-Sep	1	66	8,967	0	277	33	3	99
38	15-Sep	0	2	2,734	0	28	10	3	30
39	22-Sep	1	0	2,466	0	64	14	3	42
40	29-Sep	0	0	1,565	0	0	15	3	45
41	6-Oct	0	0	43	0	0	1	3	3
42	13-Oct	0	0	0	0	0	0	2	0
Total 1992-2001		1,850	214,374	40,464	78,624	231,966		72	4,977
Average		2,987	141,742	62,348	124,375	299,388		49	3,638
2002 as % of 10-Yr Avg.		62%	151%	65%	63%	77%		147%	137%

[a] The days open listed in this table reflect open fishing periods for all waters of District 11. Taku Inlet only, statistical area 111-32, was open for two days each week during weeks 32-36.

Fishing time was limited to two days per week in Taku Inlet during weeks 32-34 specifically to protect Tatsamenie Lake sockeye salmon and during weeks 35 and 36 specifically to protect Taku River fall chum salmon.

Approximately 84% of the chinook salmon were harvested from Taku Inlet and 16% were harvested from Stephens Passage. Alaskan hatchery fish contributed 232 fish as estimated by coded wire tag (CWT) analysis, or approximately 13% of the harvest. The Taku River stock assessment program estimated the above-border run-size at approximately 42,063 fish. The ten-year (1992-2001) average above-border run-size is 52,081. The escapement goal range is from 30,000 to 55,000 chinook salmon.

The total Taku River sockeye salmon run was estimated at 249,436 fish (Table 10); about 85% of the DFO preseason forecast of 293,000 sockeye. Based on the escapement goal midpoint of 75,000 wild Taku River sockeye, the TAC was 174,436 fish. The U.S. TAC was 142,703 wild Taku River sockeye (82% of the TAC). It is estimated that the total harvest of Taku River wild sockeye salmon was 118,248 fish, 68% of the TAC, and 55% of the total sockeye harvest in the District. Enhanced sockeye salmon from a joint U.S./Canada fry-planting program at Tatsamenie Lake contributed an estimated 658 fish, or 0.3% of the total sockeye catch. Additionally, an estimated 86,000 Snettisham Hatchery sockeye salmon were harvested in common property fisheries in District 111, of that total enhanced sockeye harvest approximately 25,878 sockeye salmon were harvested from the Speel Arm Terminal Harvest Area. This includes an estimated 25,006 (97%) enhanced sockeye and 872 (3%) wild sockeye from Port Snettisham systems.

The estimated above-border in-river wild Taku River sockeye run, based on mark-recapture estimates at Canyon Island, was 135,043; 105% of the 18-year (1984-2001) average of 128,802. Subtracting the cumulative Canadian catch of wild Taku River sockeye salmon (31,731), escapement of wild Taku River sockeye was 103,312; 138% of the escapement goal of 75,000. Sockeye escapements to Kuthai, Little Trapper and Tatsamenie Lakes based on weir counts were 176%, 69% and 68% of the ten-year average, respectively. Escapements of sockeye salmon to Port Snettisham systems were fair, with 5,016 counted through a weir at Speel Lake and a peak aerial survey count of 10,000 sockeye salmon at Crescent Lake.

Coho stocks harvested in District 111 include runs to the Taku River, Port Snettisham, Stephens Passage, and local Juneau area streams as well as Alaskan hatcheries. The coho catch of 40,464 fish was 65% of the 10-year (1992-2001) average. Approximately 77% of the coho were harvested in Taku Inlet (below the ten-year average of 85%); 22% were harvested from Stephens Passage and less than 1% were harvested from inside Port Snettisham. Alaskan hatchery coho salmon contributed 1,621 fish or 4% of the District 111 harvest. Weekly coho harvests were above average during SW29 through SW32, but below average during the remainder of the season. The peak week for the commercial, drift gillnet coho catch (8,967) was SW37. For most of the season, weekly estimates of Taku River coho abundance indicated an above average run size. The final in-river abundance estimate of coho escapement above Canyon Island was 187,705 fish. The 2002 in-river abundance estimate for coho was the highest since 1987, and approximately 2.5 times the 15-year (1987-2001) average of 61,895. The cumulative Canadian coho catch was 7,042. Therefore, coho escapement for the Taku River was estimated to be approximately 180,000 fish, greatly surpassing the escapement goal of 35,000.

The District 111 pink salmon harvest of 78,624 fish was 62% of the ten-year (1992-2001) average. The escapement number to the Taku River was unknown; however, the number of pink salmon passing through the fish wheels at Canyon Island was used as an

index of escapement. The 2000 (parent year) Canyon Island pink salmon fish wheel catch was 6,529. The 2002 Canyon Island pink salmon fish wheel catch was 5,672. The 1992-2000 average-year Canyon Island fish wheel catch of pink salmon was 17,600 fish. The 2002 Canyon Island pink salmon fish wheel catch was 32% of the 1992-2000 average. Pink salmon escapement to the Taku River can be characterized as below average.

Table 10. Preliminary Taku sockeye salmon run reconstruction, 2002. {Estimates do not include spawning escapements below the U.S./Canada border. The TAC does not account for the change in harvest share agreements when the sockeye escapement exceeds 100,000 fish}.

	Taku[a]
Estimated Taku In-river Run	135,043
Estimated U.S. Catch Taku fish	114,392
Total Run	249,436
Escapement Goal	75,000
TAC	174,436
U.S. TAC	142,703
Estimated U.S. Taku Catch	113,248
Projected personal use catch	5,000
Remaining U.S. TAC	24,593
U.S. harvest share (catch/total TAC)	0.677
Canada TAC	31,733
Estimated Canada catch	31,731
Remaining Canada TAC	2
Canada harvest share (cat/total TAC)	0.182

[a] United States and Canada TAC computations based on harvest sharing arrangement described in Annex IV, Chapter 1, (3)(b)(1)(i).

The catch total of 231,966 chum salmon was 77% of the ten-year (1992-2001) average, and was comprised almost entirely of summer run fish. The summer chum run is considered to last through mid-August (week 33) and is comprised mostly of domestic hatchery fish, with small numbers of wild stock fish contributing. Chum salmon returning both to DIPAC hatcheries in Gastineau Channel and to the DIPAC remote release site at Limestone Inlet contributed a major portion of the catch but quantitative contribution estimates were not available. Approximately 47% of the District 111 chum catch was made in Taku Inlet, 53% in Stephens Passage, and less than 1% inside Port Snettisham. The catch of 929 fall chum salmon (i.e. chum salmon caught after week 33) was 12% of the ten-year (1992-2001) average. Most of these chums are probably of wild Taku and Whiting River origin. Escapement numbers to the Taku River are unknown; however, the numbers of fall chums passing through the fish wheels at Canyon Island were used as an index of escapement. The index number for 2002, 205 fall chums, was a decrease from 2001 and is 38% of the long-term average.

Several other fisheries in the Juneau area harvested Taku River stocks in 2002. Personal use salmon permits were issued for Taku River sockeye salmon. Estimates of the harvest in that fishery are not available at this time although a projection of 5,000 fish is included for preliminary run size projections. The 2002 Juneau-area sport fishery harvested an estimated 15,003 chinook salmon. A number of stocks are known to contribute to the Juneau area sport fishery, including those from the Taku, Chilkat, and King Salmon rivers, and local hatchery stocks, but the major contributor of large, wild mature fish was believed to be the Taku River. Of the 15,003 chinook harvested, 1,700 (11%) were estimated to be of Taku River origin based on coded wire tag analysis. The July Hawk Inlet shoreline purse seine fishery operating north of Point Marsden in Chatham Strait did not open this year. A large number of stocks, including the Taku River, contribute to this pink salmon directed fishery. A purse seine test fishery was conducted during each Friday in July, with catches totaling 15 chinook, 884 sockeye, 50 coho, 11,392 pink and 4,173 chum salmon.

Alsek River Area Fisheries

Although harvest sharing arrangements of Alsek salmon stocks between Canada and the U.S. have not been specified, Annex IV of the Pacific Salmon Treaty does call for a cooperative attempt to rebuild depressed chinook and early-run sockeye stocks. Preseason expectations were for an average coho run and below average runs of chinook and sockeye salmon. These expectations were based on parent-year escapements to the Klukshu River. The Alsek River commercial fishery opened on the first Monday in June, statistical week 23 (June 3). The initial opening was for 24 hours. For the next three weeks of the season weekly openings were extended to 48 hours as sockeye CPUE remained well above average. These openings were limited to 48 hours to protect Klukshu River sockeye stocks. During the first week of July the weekly opening was limited to 24 hours due to below average sockeye CPUE. For the next two weeks fishery performance was very strong, and both weekly fishing periods were extended to 72 hours. Openings were limited to 24 hours for the remainder of the sockeye fishery (weeks 30 through 33). The fishery targeted coho stocks after late August and fishing times were extended to 7 days per week for most of the coho season.

The Dry Bay commercial set-gillnet fishery harvested 700 chinook, 16,918 sockeye, and 9,525 coho salmon (Table 11). No pink and only one chum salmon were harvested. The chinook harvest was 27% above the 1992-2001 average, the sockeye harvest was average, and the coho harvest was 64% above average. The number of fishing days was 73. The majority of fishing time (55 days) occurred late in the season (late August through the end of October) after the sockeye run had largely passed through the fishery. The total effort expended in the fishery was 269.5 boat-days, 64% of the 1992-2001 average.

Klukshu weir counts totalled 2,240 chinook, 25,711 sockeye, and 9,921 coho. The sockeye count was the fifth highest on record, while the coho count is the highest on record. Spawning escapement objectives were met for Kluckshu River chinook and sockeye salmon.

Table 11. Weekly catch and effort in the U.S. commercial fishery in the Alsek River, 2002.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days Open	Permit Days
23	3-Jun	188	418	0	0	0	11	1	11
24	10-Jun	334	1,996	0	0	0	11	2	22
25	17-Jun	126	1,696	0	0	0	10	2	20
26	24-Jun	31	2,089	0	0	0	9	2	18
27	1-Jul	11	780	0	0	0	8	1	8
28	8-Jul	7	4,197	0	0	1	9	3	27
29	15-Jul	1	4,659	0	3	0	10	3	30
30	22-Jul	0	530	0	0	0	9	1	9
31	29-Jul	2	231	0	0	0	5	1	5
32	5-Aug	0	161	3	0	0	6	1	6
33	12-Aug	0	0	0	0	0	0	1	0
34	19-Aug	0	47	86	0	0	3	3	9
35	26-Aug	0	58	742	0	0	4	3	12
36	2-Sep	0	44	2,561	0	0	4	4	16
37	9-Sep	0	10	3,665	0	0	5	5.5	27.5
38	16-Sep	0	2	2,088	0	0	4	7	28
39	23-Sep	0	0	379	0	0	3	7	21
40	30-Sep	0	0	0	0	0	0	7	0
41	8-Oct	0	0	0	0	0	0	7	0
42	15-Oct	0	0	0	0	0	0	7	0
43	22-Oct	0	0	0	0	0	0	4.5	0
Totals		700	16,918	9,525	0	1	16	73	269.5
1992-2001 Avg.		550	16,986	5,823	3	115	11	45	506
2002 % 10-yr Avg.		127.3%	99.6%	163.6%	-	-	62.8%	162%	63.7%

Transboundary River Joint Enhancement Activities

The transport of sockeye fry back to the Canadian lakes took place between May 30 and June 17, 2002. A total of 10 flights resulted in close to 4.8 million fry being transferred (Table 12). Fry were produced at Snettisham Hatchery from a collection of 3.5 and 3.3 million eggs taken in year 2001, at Tatsamenie and Tahltan Lakes respectively. The IHN virus was detected in three Tatsamenie incubators during the incubation period dropping overall survivals to 69.7%. Tatsamenie thermal marking took place before the fish hatched and all release groups were successfully marked.

Table 12. Releases and survivals of 2001 brood sockeye salmon outplanted into Stikine and Taku systems in May – June 2002.

Brood Stock	System Stocked	# of Trips	# of Fry Released	Green to Eye % Survival	Green to Release % Survival
Tahltan L.	Tahltan L. (Stikine)	5	2,533,000	82.9%	76.6%
Tatsamenie L.	Upper Tats.L. (Taku)	5	2,233,000	90.0%	63.8%
	Ave/Totals	10	4,766,000		69.7%

Two different release groups were planted into Tatsamenie Lake in 2002. One group of 1.5 million fry was held in net pens for short-term rearing and the other group of 0.7 million was released as unfed fry. Improved survival from a larger size (fed fry) at release is expected. In Tahltan Lake, the fry were held for only a short period in net pens to observe any transport mortality (there was no significant loss of fry).

The year 2002 egg takes started on September 1st at Tahltan Lake and Sept 19th at Tatsamenie Lake. At Tahltan, 1,490 females collected produced 4,320,000 green eggs. In Tatsamenie Lake, 542 females were spawned yielding an estimated 2,500,000 green eggs. The disposition of the fry resulting from 4.3 million eggs from Tahltan Lake will be decided at the fall 2002 TTC meeting in Juneau and all of the brood year 2002 Tatsamenie Lake fry will be planted in Tatsamenie Lake in 2003.

Special funding was awarded to ADF&G in 2002 from the Southeast Sustainable Salmon Fund (SSSF) for further assessment of a sockeye radio-tagging project and for construction of a fish pass/harvest structure on the Tuya River. These funds were intended to provide for efficient management of surplus adult sockeye at the Tuya River blockage and to assess the ability of sockeye salmon to migrate to Tuya Lake (93 miles above the blockage) and successfully spawn. The radio tagging was completed and preliminary information indicates that only a small number of fish were able to make it above migration barriers to the lake. Construction of the fish pass/harvest structure was delayed in the spring and again in the fall due to high water levels. At present design plans for this fish pass/harvest structure are being reviewed for possible alterations.

During the 2002 season the ADFG thermal mark lab received 12,158 sockeye otoliths collected by ADFG and DFO staff as part of the U.S./Canada fry-planting evaluation program. These collections came from commercial and test fisheries in U.S. waters and in Canadian fisheries on the Taku and Stikine Rivers over a 12-week period. In addition, several escapement samples were examined. Combined, the laboratory processed 11,334 of the otoliths received (93%) and provided estimates on hatchery contributions for almost 100 distinct sampling collections. Of these totals, 2,390 otoliths were identified and classified as belonging to one of 29 marked groups. Estimates of the percentage of hatchery fish contributed to commercial fishery catches were provided to ADF&G and DFO fishery managers 24 to 48 hours after samples arrived at the lab.

Southeast Alaska Chinook Salmon Fishery

The 2002 preseason chinook salmon target harvest level was determined using the abundance index of 1.74 generated with the CTC model calibration 0204. The corresponding target harvest of 356,500 was identified using Table 1 of Chapter 3. The preliminary estimate of the 2002 chinook salmon catch by all Southeast Alaska fisheries was 442,200 fish (Table 13). The base catch (total minus the add-on) was 373,900 fish, 4.9% above the target harvest of 356,500.

Table 13. Chinook all-gear catches in Southeast Alaska, 1987 to 2002, and deviation from the ceiling for years for which there were ceilings. Catches in thousands. From 1987 through 1993, ceilings were set pre-season and deviations calculated from the ceiling. Since 1999, the fishery is managed for a pre-season target, but the agreement specifies a post-season compliance. There is no post-season assessment for 2002 yet.

Year	Total Catch	Add-on Catch	Harvest Target		Observed Catch	Deviation in Numbers	
			Pre or In Season	Post Season		From Pre Season	From Post Season
1987	281.9	16.7	263	263	265.3	2.3	
1988	278.9	23.7	263	263	256.8	-6.2	
1989	291.1	26.7	263	263	269.8	6.8	
1990	366.9	53.7	302	302	319.3	17.3	
1991	357.0	61.4	273	273	301.1	28.1	
1992	260.0	38.3	263	263	221.8	-41.2	
1993	301.9	33.7	263	263	270.3	7.3	
1994	261.9	30.9			234.9		
1995	231.1	56.6			176.9		
1996	217.2	68.2			155.7		
1997	339.2	47.6			287.5		
1998	271.0	26.2			243.5		
1999	251.0	46.3	192.8	184.2	200.2	7.4	16.0
2000	263.3	73.9	189.9	178.5	186.3	-3.6	7.8
2001	260.0	70.7	189.9	250.3	189.4	-0.5	-60.9
2002	442.2	68.3	356.5		373.9	17.4	

Troll Fishery

The winter troll fishery harvested 29,400 chinook salmon from October 11, 2001 through April 14, 2002. A total of 1,960 fish were from Alaska hatcheries with 1,600 fish counting toward the Alaska hatchery add-on.

Spring fisheries were conducted prior to the July general summer opening. The spring fisheries are designed to increase the harvest of Alaskan hatchery produced chinook salmon by allowing trolling in small areas close to the hatchery where these fish concentrate. Terminal fisheries are a portion of the spring fisheries and occur directly in front of hatcheries or at remote release sites.

While there is no ceiling on the number of chinook salmon harvested in the spring fisheries the take of Treaty chinook salmon is limited according to the percentage of the Alaskan hatchery fish taken in the fishery. The catches in 2002 were: 6,000 fish in the

terminal fisheries and 37,600 fish in the general spring fisheries. A total of 52% (22,900) of the chinook salmon landed in these fisheries were from Alaska hatcheries of which 20,800 counted toward the Alaska hatchery add-on..

In the 2002 summer season there were two chinook salmon retention periods. The first chinook retention period began on July 1 and continued through July 18. The fishery harvested 187,000 chinook salmon of which 4,900 fish were from Alaska hatcheries (4,000 counting toward the Alaska hatchery add-on). The second opening occurred from August 12 through September 2. A total of 65,300 chinook salmon were harvested with 1,600 fish from Alaska hatcheries (1,300 counting toward the Alaska hatchery add-on). The total summer troll harvest was 252,600 chinook salmon.

Net Fisheries

Net fisheries have a guideline harvest of 8,600 chinook salmon, plus 4.3% of the annual harvest ceiling established by the Pacific Salmon Commission (15,300 for a total net harvest of 23,900), plus Alaska hatchery add-on chinook. Catches of chinook salmon in the net fisheries are incidental to the harvest of other species and only constitute a small fraction (<1.0%) of the total net harvest of all species. In 2002, the net fisheries harvested 31,700 chinook salmon of which 18,700 were from Alaska hatcheries with 18,200 counting as Alaska hatchery add-on..

Recreational Fisheries

The 2002 recreational fishery had a harvest of 85,200 chinook salmon of which 27,000 were from Alaska hatcheries (23,500 counting toward the Alaska hatchery add-on).

Southeast Alaska Coho Salmon Fisheries

Attachment B of the June 30, 1999 U.S.-Canada Agreement relating to the Pacific Salmon Treaty specifies provisions for in-season conservation and information sharing for northern boundary coho salmon. In 2002, troll CPUE in Area 6 in the early weeks of the fishery averaged 25.4, which was slightly above the highest specified boundary area conservation trigger of 22. The mid-July projection of region-wide total commercial harvest was greater than the 1.12 million trigger for an early region-wide troll closure, specified in Alaska Board of Fisheries regulation and the PST conservation agreement.

The all-gear catch of coho salmon totaled 2.74 million fish of which 2.47 million were taken in commercial fisheries (Table 14). Troll catch rates throughout the season were the fourth highest since 1982, with a mean-average seasonal catch rate for power trollers of 77 fish per boat-day, peaking at 132 in early August, and were above the 1994 catch rates throughout the region for six weeks from the last week in July to the first week in September. The sport catch of 267,000 fish is a very preliminary projection. Wild production accounted for 1.87 million fish (76%) in the commercial catch. Total run size for four long-term indicator stocks ranged from 115% to 207% of the 20-year average. The strong returns appear to have resulted from a combination of strong smolt and high marine survival rates for most systems. Escapements throughout the region were well above goal ranges and were at record levels in many cases.

Exploitation rates were substantially lower than average. Troll fishery exploitation rates on inside indicator stocks ranged from 15-18%, which was about half of the 1990's average. Low total exploitation rates were primarily the result of: 1) low overall troll effort, 2) low prices both troll and gillnet fish which further depressed fishing effort, and 3) longer than average troll chinook retention periods which reduced length of time that coho were the target species. The 2002 region-wide troll coho fishery began July 1 and ended September 30, with a closed period from August 11-12.

Table 14. Coho salmon harvest in Southeast Alaska in 2002 by gear type (preliminary).

Gear Type	Harvest
Troll	1,315,000
Purse seine	477,800
Drift Gillnet	475,500
Set Gillnet	200,900
Sport	267,000
Total	2,736,200

Preliminary 2002 Chinook and Coho Salmon Catches in Washington and Oregon Fisheries

The 2002 season was conducted under the renewed Annex IV arrangements of the Pacific Salmon Treaty. This report covers the fisheries that occur between Cape Falcon and the U.S./Canadian border. These fisheries are subject to the chinook ISBM obligations contained within the 1999 Agreement. In this same region, this year's coho fisheries were conducted under the presumption that the abundance based management plan agreed upon in February 2002 was in effect.

Preseason Planning

Southern U.S. regional management coordination occurs within the preseason Pacific Fisheries Management Council process commonly referred to as "North of Falcon". Within this process, participants evaluate the biological and social/economic consequences of options for the outside (ocean) and inside (Puget Sound and in-river) fisheries. The end product is a total fishery package that achieves both domestic and Pacific Salmon Treaty obligations as assessed by our domestic fishery regulation assessment models.

For the 2002 season, based on pre-season abundance forecasts, the PST ISBM general obligation for chinook was triggered for the following stocks: Mid-Columbia River summers, Nooksack River spring, Skagit River spring, Skagit River summer/fall, Stillaguamish River summer/fall, Snohomish River summer/fall, and Lake Washington summer/fall. U.S. coho stocks were all forecasted to be at the moderate to abundant levels and were not anticipated to represent a management constraint in southern U.S. mix-stock fisheries. The preseason manager-to-manager meeting between U.S. and Canadian interests identified the only Canadian stock of concern for southern U.S. fisheries as Thompson Coho, which was in low status.

Descriptions of the various regional fisheries, their general management constraints, and preliminary estimates of landed catch are listed in the following subsections. Tables 15 and 16, contrast preseason projections of catches with the preliminary estimates of landed catch for chinook and coho in the various fisheries of interest to the Pacific Salmon Commission. Complete fishery catch reports and preliminary estimates of spawning escapements are not available at this time, given the run timing of the region's coho and chinook stocks.

Ocean Fisheries

Fisheries off the Oregon and Washington coast are developed by the state of Oregon and Washington, treaty Indian tribes, and federal management entities through the North of Falcon process. The ocean fisheries in U.S. waters are typically constrained by coho and chinook quota ceilings.

North of Cape Falcon Ocean Fisheries

Management objectives for chinook fisheries in this area are to satisfy standards for ESA-listed stocks, and to the extent possible, provide for viable ocean and in-river fisheries while protecting depressed Columbia River natural stocks and meeting hatchery fall chinook brood stock needs. Lower Columbia River and Bonneville Pool hatchery fall chinook have historically been the major stocks contributing to ocean fishery catches in the North of Cape Falcon area. In 2002, federal ESA standards and the need to constrain impacts on Puget Sound and lower Columbia River chinook stocks guided fishery management decisions.

Coho fisheries were structured to address standards for ESA listed stocks, especially Oregon Coastal Natural (OCN) coho, and PST obligations regarding Thompson River coho. Low abundance levels of lower Columbia River hatchery coho defined restrictions implemented for ocean fisheries in this area and for fisheries inside the Columbia River. U.S. fisheries including those within Puget Sound were constrained to maintain a total exploitation rate under 10 percent on Thompson coho as per agreement.

Treaty Troll Fishery

The treaty troll fishery was constrained by a chinook quota of 60,000 and a coho quota of 60,000. The season was comprised of a May/June chinook directed fishery and a July through September 15 all species fishery. The season concluded with a catch of 39,100 chinook and 17,500 coho.

Non-treaty Troll Fishery

The preliminary estimates of non-tribal harvest in the 2002 North of Falcon troll fishery are 82,068 chinook and 1,687 coho. The chinook catch represents 99% of the 82,500 chinook harvest quota, with 46,986 chinook harvested in the May1-June15 fishery and the remaining 35,082 harvested in August and September. The coho catch represents harvest in a mark-selective fishery (healed adipose fin-clips) south of Leadbetter Point in August and September. Total landings were 34% of the 5,000 coho harvest quota.

Recreational Fisheries

Coastwide Chinook-directed Spring Fishery

The ocean recreational salmon fishery between Cape Falcon, Oregon and the U.S.-Canada border was open for chinook only from May 25 through June 16 on a quota of 20,000 chinook. No in-season management action was necessary. The total recreational catch coastwide (including Oregon landings) through Sunday, June 16 is estimated at 19,437 chinook (97% of the quota).

Columbia Ocean Area (including Oregon)

Ocean Area 1 (Columbia Ocean Area) opened for recreational all-species salmon fishing on Sunday, July 7 with a quota of 55,700 coho and a guideline of 11,200 chinook. The fishery was closed on Monday, September 2 and reopened on Friday, September 6 through Sunday, September 15. Up to 9,000 coho remaining from the Westport recreational quota were allowed to be transferred to the Columbia River area to allow fishing though September 15. In-season regulation changes to this area included an increase in the minimum size limit on chinook to 26 inches effective July 21, and prohibition of chinook retention effective August 10. The catch estimate for Area 1 through Sunday, September 15 is 8,458 chinook and 59,601 coho.

Westport

Ocean Area 2 (Westport) opened for recreational all-species salmon fishing on Sunday, June 30 with a quota of 39,280 coho and a guideline of 32,000 chinook. Ocean Area 2 closed to salmon fishing on August 15; the area reopened August 18 and closed August 19. In-season regulation changes to this area included an increase in the minimum size limit on chinook to 28 inches effective July 21, and a daily bag limit modification to one chinook within the two-salmon bag limit effective August 10. The catch estimate through Monday, August 19 is 26,987 chinook and 19,000 coho.

La Push

Ocean Area 3 (La Push) opened for recreational all-species salmon fishing on Sunday, July 7 with a quota of 2,770 coho[3] and a guideline of 1,700 chinook. The fishery was closed on its automatic closure date Sunday, September 8, and reopened September 21 through October 6 in the "bubble" area[4] only around the mouth of the Quileute River. In-season regulation changes to this area included an increase in the minimum size limit on chinook to 28 inches effective July 21, and prohibition of chinook retention effective August 10. The catch estimate for Area 3 through Sunday, October 6 is 1,854 chinook and 1,667 coho.

Neah Bay

[3] A sub-quota of 2,770 coho was in effect in Area 3 for the time period July 7 - September 8. Effective September 21, the fishery reopened through October 6, or until attainment of the total area quota of 2,870 coho.

[4] Inside an area defined by a line from Teahwhit Head northwest to "Q" buoy to Cake Rock, then true east to the shoreline.

Ocean Area 4 (Neah Bay) opened for recreational all-species salmon fishing on Sunday, July 7 with a quota of 11,780 coho and a guideline of 2,600 chinook. The fishery was closed on its automatic closure date Sunday, September 8. In-season regulation changes to this area included an increase in the minimum size limit on chinook to 28 inches effective July 21, and prohibition of chinook retention effective August 10. The catch estimate for Area 4 through Sunday, September 8 is 3,783 chinook and 8,347 coho.

Coastwide Summer Fishery Totals

Overall recreational total allowable catches in the area between Cape Falcon, Oregon and the U.S. – Canada border of 40,933 chinook[5] and 115,000 coho applied to the summer fisheries. Through Sunday, October 6, total catch is estimated at 41,082 chinook (less than 1% over the quota) and 88,615 coho (77% of the quota) coastwide.

Washington Coastal Fisheries

North Washington Coastal Rivers

Net and sport fisheries directed at salmon in this region were implemented based upon pre-season, tribal-state agreements and subject to in-season adjustment. The north coastal rivers net harvest (all by tribal fisheries) includes catch for the Waatch, Sooes, Quillayute, Hoh, Queets, Quinault, Moclips, and Copalis rivers. The 2002 commercial net fisheries in north coastal rivers have harvested an estimated 13,016 chinook and 68,753 coho through October. Estimates of sport fishery catches are not available until approximately one year following the calendar year of the fishery.

Grays Harbor

Net and sport fisheries directed at salmon in Grays Harbor are implemented based upon pre-season, tribal-state agreements and subject to in-season adjustment. Harvest for Grays Harbor includes catch from both the Humptulips and Chehalis rivers. The 2002 tribal net fisheries have harvested an estimated 2,232 chinook and 21,466 coho through November. The preliminary 2002 non-Indian commercial net harvest in Grays Harbor was less than 100 chinook and 6,900 coho salmon. Recreational fishery harvest estimates are unavailable at this time.

Columbia River Fisheries

Treaty-Indian and non-Indian commercial and sport fisheries for chinook and coho in 2002 occurred during the winter/spring (February-May), summer (June-July) and fall (August-October) periods. All fisheries were constrained by impacts on ESA-listed stocks. Winter/spring fisheries were constrained by impacts on ESA-listed upper Columbia River and Snake River spring chinook while fall fisheries were constrained by impacts to ESA-listed Snake River fall chinook.

[5] Overall 2002 coastwide recreational TAC of 67,500 chinook, less 19,450 taken during the Spring fishery, less 7,117 associated with additional hooking mortality resulting from in-season regulation modifications.

The non-Indian winter (February-March) commercial fishery was limited to selective harvesting with tangle net gear. A total of 14,200 adipose fin-clipped chinook were taken in this fishery. The 2002 mainstem recreational fishery operated under selective fishery regulations and 20,500 fin-clipped chinook were landed with 175,100 angler trips. The treaty Indian fishery caught 33,100 spring chinook including commercial, ceremonial and subsistence catches.

Non-Indian fall fisheries were managed not to exceed a total impact rate (including ocean and Columbia River fisheries) of 49% on LRH (Coweeman) fall chinook. Early fall mainstem fisheries consisted of chinook salmon seasons that occurred in early August (August 4-12) and late August (August 18-28). Early August fisheries occurred below Longview Bridge, except for the final fishing period which occurred from the Tongue Point/Grays Point line upstream to Warrior Rock. Late August fisheries occurred upstream of the I-205 Bridge.

Late fall mainstem fisheries were initiated on September 16 and completed on October 31 and included general salmon seasons plus coho and chinook target seasons. Open areas included most or all of Zones 1-5 with certain closed areas adopted to protect ESA listed chinook, coho, and chum. Preliminary estimates of landings for the fall season of the non-Indian commercial fishery were 99,593 coho and 33,840 chinook.

The Buoy 10 fishery (from the mouth upstream to the Tongue Point/Rocky Point line) opened August 1 for chinook, adipose fin-clipped coho, and adipose fin-clipped steelhead. For the season a total of 80,500 angler trips resulted in 19,000 chinook and 6,000 coho being retained. The catch of 19,000 chinook in the Buoy 10 fishery is the third largest catch on record but only half the record large catch of 42,100 in 1987.

The mainstem Columbia River (from the Tongue Point/Rocky Point line upstream to Hwy 395 Bridge at Pasco) opened for chinook and coho on August 1. Non-adipose fin-clipped coho were released downstream from Bonneville Dam. For this season a total of 110,800 angler trips resulted in 21,200 chinook caught, the largest catch on record.

The treaty Indian commercial fishery consisted of five 3½-4½ day weekly fishing periods beginning on August 28 and ending on September 28. Landings of 130,600 chinook in the treaty Indian fishery are the largest total since 1988.

Puget Sound Fisheries

Puget Sound marine fisheries of interest to the Pacific Salmon Commission in 2002 were regulated to meet conservation and allocation objectives for chinook, coho, pink, chum and sockeye salmon stocks, per tribal-state agreement. For Puget Sound chinook, listed under the ESA, fisheries were managed according to the state and tribal joint resource management plan, the Puget Sound Comprehensive Chinook Harvest Management Plan. This management plan defines limits to total exploitation rates for natural stocks and was determined by the National Marine Fisheries Service to be consistent with requirements specified under the ESA 4(d) Rule.

Release requirements were applied to many recreational and commercial fisheries for chinook, coho and for chum salmon to protect ESA-listed summer chum.

In-season adjustments to fishery plans were implemented where information was available to indicate significant changes in pre-season expected returns to terminal areas, including Fraser Panel regulated fisheries in the Strait of Juan de Fuca and San Juan Islands.

Strait of Juan de Fuca Recreational

Recreational fishing was closed to chinook salmon retention in catch reporting Areas 5 & 6 except the period from February 15 to April 10 and during the month of November. In addition, for catch Area 5 only, during the month of July, chinook salmon landings were allowed up to a quota of 2,000 fish. Selective fishing for marked hatchery coho was open from July 1 through September 30.

Catch for the July chinook directed fishery in Area 5 was estimated in-season by creel survey and totaled 1,900 chinook. Sampling for catch and encounter estimates was conducted in Area 5 throughout the selective mark coho fishery but estimates are not available at this time.

Strait of Juan de Fuca Net

Preliminary estimates of the 2002 catch in Strait of Juan de Fuca tribal net fisheries are 1,100 chinook and 5,900 coho salmon.

Strait of Juan de Fuca Treaty Troll (Area 4B, 5, and 6C)

The preliminary estimates of the 2002 Strait of Juan de Fuca treaty troll fishery are 1,500 chinook and 100 coho through November. The tribal catch estimates from this area do not include catches from Area 4B during the May-September PFMC management period, which have been included in the North of Cape Falcon troll summary.

San Juan Islands Net (Area 7 and 7A)

Preliminary estimates of the 2002 catch in Strait of Juan de Fuca tribal net fishery directed at sockeye or chum salmon totaled 1,800 chinook and 3,400 coho salmon. Non-Indian landings totaled approximately 200 chinook and 200 coho salmon. Impacts to chinook and coho were less than preseason expectations.

San Juan Islands Recreational

The southern and southeastern (Rosario Strait) portions of this catch area were again closed in 2002 to protect migrating, mature Puget Sound chinook salmon. The remaining area was opened for retention of chinook and coho salmon from July 1 to September 30. Release of unmarked coho salmon was required for the months of August and September. Chinook retention also was allowed in the entire area from February 1 – March 30 and for the month of November. No estimate of catch is available at this time.

Inside Puget Sound (Areas 8-13) Recreational

Catch and angler effort estimates for these areas are not available at this time.

Puget Sound Marine Net

To achieve conservation objectives for Puget Sound chinook and coho, only very limited commercial fishing opportunity directed at chinook and coho was planned for 2002. Tribal and non-tribal net fishery harvests in Puget Sound marine areas 8 - 13, not including extreme terminal or river fisheries, totaled only 500 chinook compared to the preseason expectation of more than 8,000. Coho catches totaled 38,200 compared to a preseason expectation of approximately 62,000. Restricted opportunity and poor prices affected commercial activity. Additional tribal net harvest of coho and chinook occurred in river fisheries.

Table 15. Preliminary 2002 landed chinook catches for Washington and Oregon fisheries of interest to the Pacific Salmon Commission (rounded to nearest 100)[1]

Fishery	Preseason	Preliminary Postseason		
		Tribal	Non-Tribal	Total
Ocean Fisheries				
Troll				
Cape Flattery & Quillayute (Areas 3,4&4B)[2]	109,900	38,900	21,600	60,500
Grays Harbor (Area 2)	32,800	200	45,200	45,400
Col. R. (OR Area 2 and WA Area 1)	2,100	0	14,200	14,200
Sport				
Neah Bay & LaPush (Areas 3,4 & 4B)	5,800		7,200	7,200
Grays Harbor (Area 2)	45,000		42,500	42,500
Col. R. (OR and WA Areas 1)	16,700		10,800	10,800
Inside Fisheries				
Troll				
Strait of Juan de Fuca (Areas 4B, 5 & 6C)[3]	1,700	1,500		1,500
Sport				
Juan de Fuca (Area 5&6 summer only)	2,000		1,900	1,900
Puget Sound Sport (Areas 7-13 all year)	39,800		NA	NA
North WA Coastal Rivers	4/		NA	NA
Grays Harbor (Areas 2A-2D)[5]	4/		NA	NA
Columbia River Sport[6] - Spring			20,500	20,500
- Fall	37,400		41,800	41,800
Net				
Cape Flattery (Area 4)	400	<50		<50
North WA Coastal Rivers	NA	13,000	13,000	13,000
Grays Harbor (Areas 2A-2D)[7]	4,800	2,200	<50	2,200
Columbia River Net – Winter/Spring		33,100	14,200	47,300
Columbia River Net – Fall	190,500	130,600	44,500	175,100
Strait of Juan de Fuca (Areas 4B,5,6,6A,6C)	1,400	1,100	0	1,100
San Juan Islands (Areas 7 and 7A)	5,500	1,800	200	2,000
Puget Sound Marine (Areas 8 – 13)[7]	8,400	500	0	500

1/ Estimates represent landed catch only and do not include non-retention mortality. Postseason estimates include catches from January 1 through October, 2002, except where noted.

2/ Includes Area 4B catch during the PFMC management period (May 1 – September 30).

3/ Includes Area 4B catch outside the PFMC management period (October 1 – April 30).

4/ Stocks not modeled due to minimal contributions to North of Falcon ocean fisheries.

5/ Includes catch from the upper Chehalis (River+2A+2D) and Humptulips (River+2C).

6/ Includes both Buoy 10 and mainstem sport catch from below Bonneville Dam.

7/ Does not include catches from extreme terminal area or river fisheries.

Table 16. Preliminary 2002 landed coho catches for Washington and Oregon fisheries of interest to the Pacific Salmon Commission (rounded to nearest 100).

Fishery	Preseason	Preliminary Postseason		
		Tribal	Non-Tribal	Total
Ocean Fisheries				
Troll				
Cape Flattery & Neah Bay (Areas 4 & 4B) 2/	58,000	17,500	0	17,500
Quillayute (Area 3)	1,100	<50	0	<50
Grays Harbor (Area 2)	900	<50	0	<50
Col. R. (OR Area 2 and WA Area 1)	5,000	0	1,700	1,700
Sport				
Cape Flattery and Neah Bay (Areas 4 & 4B)	11,800		8,300	8,300
Quillayute (Area 3)	2,900		1,700	1,700
Grays Harbor (Area 2)	39,300		19,000	19,000
Col. R. (WA Area 1 and OR Area 2)	55,700		59,600	59,600
Inside Fisheries				
Troll				
Strait of Juan de Fuca (Areas 4B, 5 & 6C) 2/	1,233	100		100
Sport				
Juan de Fuca (Areas 5,6&7)	51,700		NA	NA
Puget Sound Sport (Areas 8-13)	65,000		NA	NA
North WA Coastal Rivers	2,500		NA	NA
Grays Harbor (Areas 2A-2D) 3/	8,800		NA	NA
Columbia River (Buoy 10)	21,200		18,600	18,600
Net				
Cape Flattery (Area 4)	<50	0		
North WA Coastal Rivers	45,800	68,800		68,800
Grays Harbor (Areas 2A-2D) 3/	35,500	21,500	6,900	28,400
Strait of Juan de Fuca (Areas 4B, 5, & 6C)	15,600	5,900	0	5,900
San Juan Islands (Areas 6, 7 and 7A)	17,400	3,400	200	3,600
Puget Sound Marine (Areas 8 – 13) 4/	61,890	38,200	0	38,200

1/ Estimates represent landed catch only and do not include non-retention mortality. Postseason estimates include catches from January 1 through October, 2002, except where noted.

2/ Includes Area 4B catch both during and outside the PFMC management period (May 1 – Sept. 30).

3/ Includes catch from the upper Chehalis and Humptulips Rivers.

4/ Does not include catches from extreme terminal area or river fisheries.

Preliminary Review of 2002 Washington Chum Fisheries of Interest to the Pacific Salmon Commission

December 2, 2002

This summary report provides a preliminary review of the 2002 chum fishing season and is subject to correction and revision as additional information becomes available.

Some Washington chum fisheries are still underway, and catch and run size information provided are preliminary data reported through November. This report addresses in detail only those fisheries of concern under the Pacific Salmon Treaty. The mixed-stock fisheries in United States (U.S.) waters that are addressed in the chum annex of the Pacific Salmon Treaty are those in the western Strait of Juan de Fuca (areas 4B, 5 and 6C), the San Juan Islands (area 7) and the Point Roberts area (area 7A). Other chum fisheries in Washington waters are primarily terminal fisheries, which harvest runs of local origin.

Mixed Stock Fisheries

Areas 4B, 5, 6C

As in previous years, the chum fishery in areas 4B,5,6C was restricted to Treaty Indian gill net gear only. The commercial chum fishery began the week of October 13 and remained open 5 days per week until November 8. No test fisheries for collection of GSI samples were conducted, and no samples for GSI analysis were collected from the commercial catch during 2002.

Only small incidental catches of chum salmon occurred in fisheries prior to the fall chum management period. 37 chum were taken prior to September 16 (summer chum management period), and 15 chum were taken as by-catch to the coho fishery between September 16 and the start of fall chum directed fisheries on October 13. Effort and catch in the chum fishery was the lowest observed since the PST was implemented in 1985, largely due to extremely low prices and low catch per effort. The commercial harvest recorded from the fall chum management period was 1,251 chum, bringing the total chum catch in areas 4B,5,6C, reported through November 30, to 1,303.

Areas 7 and 7A

Preseason forecasts were for a good return of harvestable fall chum in Puget Sound, and in-season updates of abundance indicate runs even larger than the preseason forecast. This year Canada implemented a significant change in Southern B.C. chum management, abandoning the "clockwork" stepped exploitation rates in favor of a fixed fishing schedule designed approximate a fixed harvest rate of 20%. Canada did not make a preseason forecast nor provide in-season updates of chum abundance. This was a significant deviation from the Chum Annex provisions and resulted in some uncertainty as to how the U.S. should manage its fishery in areas 7 and 7A. Based on the 20% exploitation rate objective and the catches and fishing schedule established by CDFO, the U.S. began its fishery on the normal start of the fall chum management period (week beginning 10/13) with a target quota of 120,000 chum. This was consistent with the Chum Annex provisions that call for a catch quota in areas 7 and 7A of 120,000 when the run size exceeds 3.0 million and the Johnstone Strait catch exceeds 280,000 chum, which are the run sizes and catches associated in the "clockwork" management scheme with the 20% exploitation rate.

Non-Treaty reef net fisheries were conducted following the end of Fraser Panel control, and fished through mid-October. This fishery was required to release all chum salmon prior to October 1. 1,856 chum were harvested by the reef net fishery, all prior to the beginning of the fall chum management period.

A Non-Treaty purse seine fishery opened at the start of the fall chum management period with a one day fishery on October 14. Non-Treaty gillnet fishing was not allowed this first week due to coho by-catch limitations. The treaty Indian fleet fished for 27 hours beginning at 6:00 AM October 15.

For the week beginning October 20, the Non-Treaty gillnet fleet fished from 5:00 PM October 21 to 7:00 AM on October 22. The Treaty Indian fishery went from 6:00 AM October 22 to 10:00 PM October 25.

For the week of October 27 the Non-treaty purse seine fleet fished on October 28 and the gillnet fleet fished on October 29. The Treaty Indian fishery went from 6:00AM October 30 to10:00 PM November 1. Additional openings were scheduled the following week (week of 11/3) for both Treaty Indian and Non-Treaty fleets but only a few landings were made, with very little catch.

There were only 5 summer chum reported caught in areas 7 and 7A prior to September 16. These were taken incidental to sockeye fisheries. The total chum catch by all gears in areas 7 and 7A is reported through late November at 109,266 fish.

Puget Sound Terminal Area Fisheries and Run Strength

Preseason forecasts for chum returns to Puget Sound were for a good fall chum run totaling about 1.8 million. Most Puget Sound chum runs have been updated in-season indicating overall returns significantly larger than expected preseason. Current in-season estimates are for a total Puget Sound chum run of about 3.0 million. Some Puget Sound chum fisheries are still underway, and additional in-season estimates of abundance may be made. At this time, spawning escapement estimates are not available, but early indications are that large numbers of chum salmon are present in most estuarine and freshwater areas.

Table 17. Preliminary 2002 chum harvest in selected Puget Sound catch reporting areas.

Week	Areas 4B,5,6C Treaty Indian	Areas 7 & 7A Treaty Indian	Areas 7 & 7A Non-Indian	Areas 7 & 7A Total
Prior to 9/16	37	4	1	5
9/16 – 10/12	15	0	1,856	1,856
10/13 – 10/19	70	26,822	41,527	68,349
10/20 - 10/26	897	18,967	2,969	21,936
10/27 – 11/2	249	13,361	3,079	16,440
11/3 – 11/9	35	160	520	680
Season Totals	1,303	59,314	49,952	109,266

Season Review and Highlights, 2002

U.S. Fraser River Sockeye and Pink Salmon Fisheries

Introduction: The 2002 Fraser River Panel season was the fourth implemented under the renewed Annex IV of the Pacific Salmon Treaty (PST). The treaty establishes a bilateral (U.S. and Canada) Fraser River Panel (Panel). The Panel develops a pre-season management plan and in-season approves fisheries directed at sockeye and pink salmon bound for the Fraser River within Panel Area waters (Figure 1). In partial fulfilment of Article IV, paragraph 1 of the PST, this document provides a season review of the 2002 U.S. Fraser River salmon fisheries authorized by the Panel. Catch and escapement information for 2002 presented is considered preliminary and based primarily on a Pacific Salmon Commission (PSC) Update as of October 15, 2002.

Figure 1. British Columbia and State of Washington Fishery Management Areas, 2002. The shaded area in the map represents the marine waters managed by the Fraser River Panel.

Pre-season Planning

The Department of Fisheries and Ocean, Canada (DFO) provided the Panel pre-season run size forecasts at various probability levels. Table 18 shows the 2002 pre-season forecasts at the 50% and 75% probability levels by stock group (run). The 50% probability level represents the mid-point of the range of possible run sizes. A forecast at the 75% probability level represents a point of the range of possible run sizes in which the actual run size has a 75% probability (3 out of 4) of being above that point. For management purposes, the Late-run sockeye salmon stock group was further broken down into a Birkenhead component and a "True Late" component (Table 19). The True Late component includes the Cultus, Weaver, Late Adams and Lower Shushwap sockeye salmon stocks.

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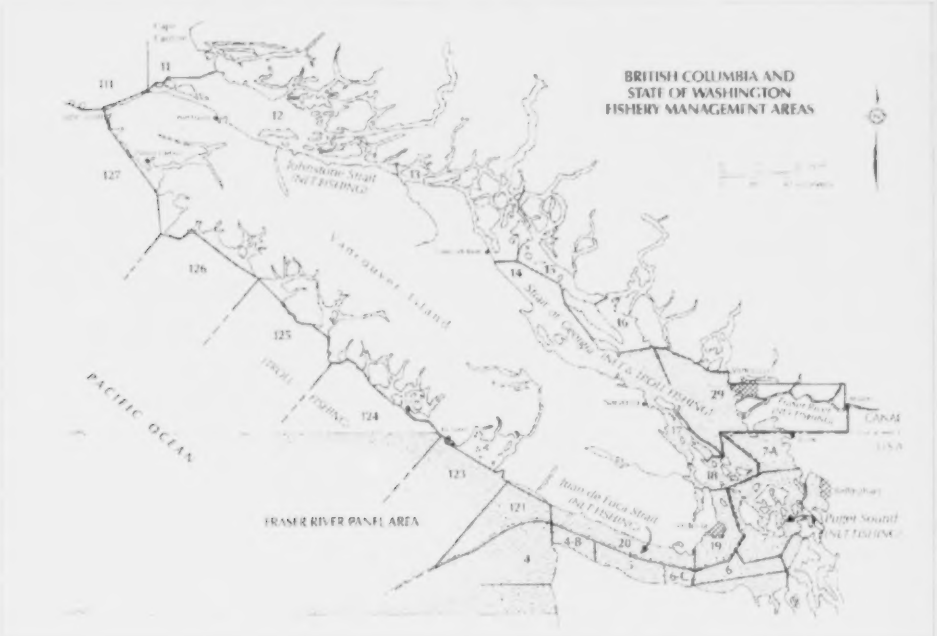

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Table 18. Pre-season forecasts at the 50% and 75% probability levels, by stock group, sockeye salmon, Fraser River, 2002.

Probability Level	Early Stuart	Early Summer	Summer	Late	Total
50%	104,000	678,100	9,005,600	3,577,000	13,365,300
75%	59,400	326,100	5,203,800	2,322,000	7,911,300

Table 19. Pre-season forecasts at the 50% and 75% probability levels, by components, Late-run sockeye salmon, Fraser River, 2002.

Probability Level	Birkenhead	"True Late"	Late-run Total
50%	421,000	3,156,000	3,577,000
75%	227,000	2,095,000	2,322,000

Pre-season, DFO also predicted the Johnstone Strait diversion (Northern Diversion) rate for sockeye salmon bound for the Fraser River of 25%. This forecasted diversion rate was based on a model that used mean sea surface temperatures measured at Kains Island for April and May of 2002. The Northern Diversion rate is the percentage of the sockeye salmon, which travel through the Johnstone Strait instead of the Strait of Juan de Fuca (Southern Diversion) on their migration to the Fraser River.

Of particular concern to the Panel during the 2002 pre-season planning was the abnormal early entry of the True Late component of the Late-run stock group observed since 1996. This early entry behavior has resulted in high (approximately 90%) en route and pre-spawn mortality rates and poses a serious threat to the future viability of the Late-run stock group. The Panel assumed that this early entry behavior would continue in 2002 and agreed to the conservation measure of maximum exploitation rate of 15% on True Lates. The Panel also agreed that no directed True Late fisheries would occur in 2002.

The summer-run sockeye salmon were expected to provide the bulk of the harvest in 2002. The Panel developed a pre-season agreement (management plan) to catch the forecasted surplus of Summer-run sockeye salmon while conserving Late-run sockeye salmon. These two runs have an overlapping run timing, which makes it difficult to harvest Summer-run sockeye salmon while keeping impacts on Late-run sockeye salmon to less than 15%. The pre-season plan provided no assurance that if the assumptions used to build the pre-season models of the return were not correct, it may not be possible to harvest the entire Total Allowable Catch (TAC).

In-Season Run Assessment, 2002:

The 2002 estimated return of 15,562,100 sockeye salmon was 16% above the pre-season forecast, at the 50% probability level (Table 20). The Summer-run stock groups was

only 76% of the pre-season forecast, while the Late-run stock group was more than double (118% above) the pre-season forecast.

Table 20. Pre-season forecasts compared to in-season abundance estimate, by stock group (run), sockeye salmon, Fraser River, 2002. Based on October 15, 2002 PSC Update.

Stock Group (Run)	Pre-season 50% Probability Forecast	In-Season Run Size Estimate	Comparison: In-Season vs. Forecast
Early Stuart	104,600	62,100	59%
Early Summer	678,100	900,000	133%
Summer	9,005,600	6,800,000	76%
Late	3,577,000	7,800,000	218%
Total	13,365,300	15,562,100	116%

The in-season assessment and management of the 2002 return was complicated by the unusual timing of the Summer-run and Late-run stock groups. The Summer-run in 2002 had a 3-day later than forecasted timing (August 8 instead of August 5), while the Late-run had a 7-day earlier than forecasted timing (August 13 instead of August 20). In 2002, these two runs had only a 5-day separation in their overlap (Figure 2).

Additionally, more sockeye salmon approached the Fraser River through the Johnstone Strait then forecasted pre-season (Table 21). The Northern Diversion rate in 2002 is estimated to have been approximately 51%, considerably above the pre-season Northern Diversion rate forecast of 25%.

Table 21. Pre-season forecasted and preliminary in-season estimate of diversion rates, Fraser River sockeye salmon, 2002.

	Pre-Season Forecast	In-Season Estimate
Northern Diversion Rate (Johnstone Strait/ Strait of Georgia)	25%	51%
Southern Diversion Rate (Strait of Juan de Fuca)	75%	49%

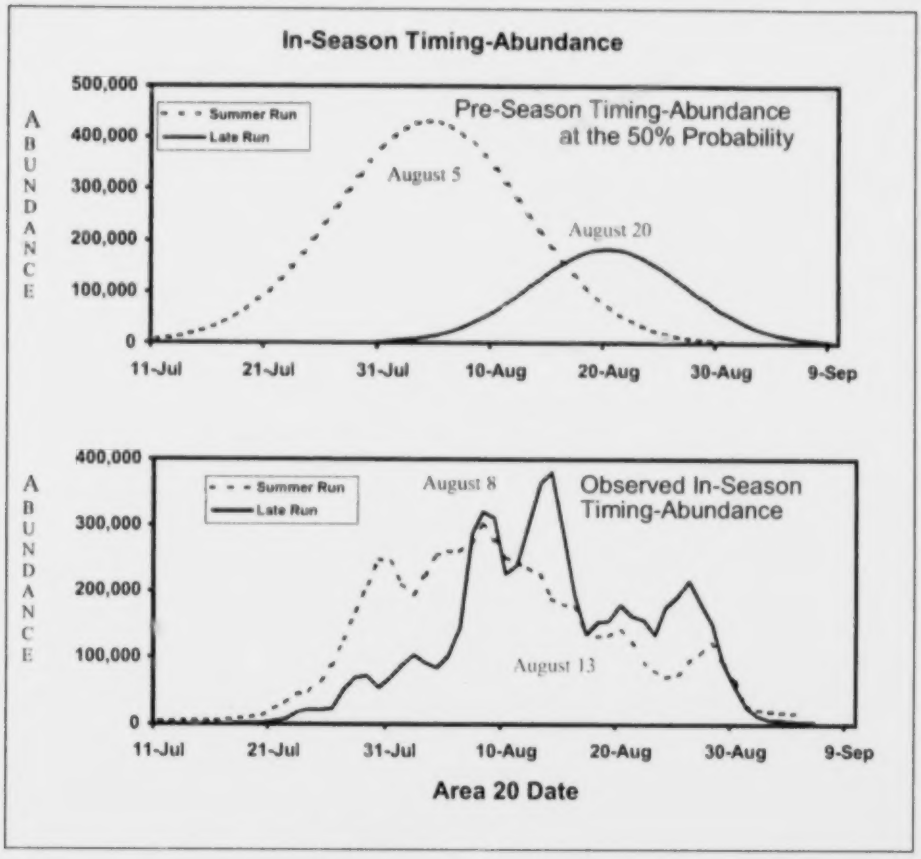

Figure 2. Preseason timing-abundance curves at the 50% probability level (top) compared to the observed in-season timing-abundance curves (bottom), for the Summer-run and Late-run, sockeye salmon, Fraser River, 2002. Dates within graph indicate the mid-point of the Summer-run (earlier dates) and the mid-point of the Late-run (later dates). The graphs show the overlap between these two runs in 2002, which made it difficult for managers to minimize the impacts of Late-run sockeye salmon while harvesting the surplus Summer-run.

In-Season Harvest Estimates, 2002:

Final post-season harvest estimates are not available at this time. Table 22 contains the preliminary sockeye salmon catches by British Columbia, Canada and Washington Fishery Management Area. The preliminary total U.S. commercial and ceremonial harvest in 2002 was 449,900 sockeye salmon.

Table 22. Preliminary catch estimates of Fraser River sockeye salmon by Canada and U.S. for 2002. Based on October 15, 2002 PSC Update. Columns and rows may not add up due to rounding errors.

Fishery	Area	Gear	D.	*Preliminary* Sockeye Salmon Catch Estimate
Commercial Catch: Canada				
A & C	Areas 1-10	Net		0
F	Areas 1-10	Troll		0
G	Areas 123-127,11-12	Troll		123,500
B	Areas 11-16	PS		456,500
D	Areas 11-16	GN		235,700
H	Areas 12-16	Troll		102,400
H	Areas 18-29	Troll		16,400
B	Area 20	PS		224,500
E	Area 29	GN		948,300
Selective Fisheries				75,500
		Canadian Commercial Total:		2,182,800
Commercial Catch: United States				
Alaska		Net		0
Washington				
	Treaty Indian (T.I.)			
	Areas 4B/5/6C	Net		43,600
	T.I.			
	Areas 6/7/7A	Net		254,600
	T.I Total:			298,200
	Non-Indian (N.I.)			
	Areas 7/7A			
	Purse Seine		74,812	
	Gill Nets		43,758	
	Reef Nets		17,765	
	N.I Total:			136,300
		Washington Commercial Total:		434,500
PSC Test				140,700
Other Test				14,800
Fraser River Aboriginal				866,200
Areas 12-124 Aboriginal				264,300
Recreational				127,500
Charter				7,000
U.S. TI Ceremonial				15,400
		Canada and U.S. Non-commercial Total:		1,435,900
		U.S. Commercial and Non-commercial (Ceremonial) Total:		**449,900**
		Canada and U.S. Sockeye Salmon Harvest Total:		4,053,200

Concerns over keeping the overall True Late exploitation rate below the agreed 15%, adhering to the no directed fisheries on True Lates, combined with the unusual timing and abundance curves observed in 2002 prevented the U.S from harvesting the entire

TAC. A total of 480,400 sockeye salmon remained on the U.S. TAC following the 2002 season (Table 23).

Table 23. The U.S. catch compared to the Total Allowable Catch (TAC), sockeye salmon, Fraser River, 2002. A balance of 480,400 sockeye salmon remained on the TAC. Based on October 15, 2002 PSC Update.

	Early Stuart	Early Summer	Summer	Late	Total
U.S. Total Allowable Catch (TAC)	0	80,600	625,500	224,400	930,500
2002 U.S. Catch	0	59,800	284,900	105,400	450,100
Balance	0	20,800	340,600	119,000	480,400

2002 Escapement Estimates:

Final post-season escapement estimates are not available at this time. Table 24 contains the preliminary 2002 gross escapement estimate of Fraser River sockeye salmon by run. Gross escapement is defined as the number of fish estimated to have entered the mouth of the Fraser River. Gross escapement is determined in-season by combining the passage estimate at Mission with escapement and the First Nation (FN) harvest below Mission. In 2002, the gross escapement target was achieved for all runs.

Table 24. Preliminary gross escapement by run, sockeye salmon, Fraser River, 2002. Escapement "Below Mission" includes First Nation harvest. All gross escapement targets were achieved in 2002. Based on October 15, 2002 PSC Update.

Run	In-Season Adjusted Gross Escapement Target	Escapement Above Mission	Escapement Below Mission	Total Escapement	Percent Of Target
Early Stuart	61,100	60,900	0	60,900	100%
Early Summer	395,300	619,900	27,000	646,900	164%
Summer	3,001,000	4,740,900	175,900	4,916,800	164%
Late	6,394,700	6,400,000	44,400	6,444,400	101%
Total	9,852,100	11,821,700	247,300	12,069,000	123%

D. 2002 UPDATE REPORTS FOR SALMONID ENHANCEMENT PROGRAMS IN THE UNITED STATES AND CANADA

The Pacific Salmon Treaty between Canada and the United States requires that information be exchanged annually regarding operation of and plans for existing enhancement projects, plans for new projects, and views concerning the other country's enhancement projects. In 1988, a committee was formed to develop recommendations for the pre- and post-season and enhancement report formats. In summary, the committee proposed that:

- detailed reports on existing enhancement facilities of the type produced in 1987 be prepared every four years;
- the Parties will annually update information on eggs taken, fry or smolt released and adults back to the facility; significant changes in facility mission or production will be highlighted in narratives; and
- the Parties will provide periodic reports through the appropriate panels on new enhancement plans.

1. 2000 and 2001 ANNUAL REPORTS ON THE SALMON ENHANCEMENT ACTIVITIES OF THE UNITED STATES

The Pacific Salmon Treaty provides that, "2. Each year each Party shall provide to the other Party and to the Commission information pertaining, *inter alia*, to: (a) operations of and plans for existing projects; (b) plans for new projects;..."(Article V). The United States provided a report dated January 31, 1990 to Canada that combined under one cover all pertinent biological data for United States enhancement projects with a detailed account of plans for new projects. The 2001 Annual Report incorporates updated information through the end of the 2001 calendar year for releases, numbers of adults returning to hatcheries, and the number of eggs taken.

Information is organized by hatchery managing agency or region, and by brood year of releases or calendar year of returns and egg takes. Each agency is to report

1. New production
2. Losses of production
3. Major trends in production
4. Brood year releases of juveniles by facility
5. Calendar year returns of adults to enhancement facilities
6. Calendar year takes of eggs by facility

In addition, a summary table of releases by species by year by agency or region appears below.*******

Agencies in Washington, Oregon and Idaho face the challenge of coordinating enhancement activities with recovery actions for endangered species. Recovery

actions regarding enhancement activities will also lead to changes in the abundance of fish available for ocean fisheries.

SOUTHEAST ALASKA

State-operated and Private Non-profit Fish Hatchery Production

New Production

In 2000 and 2001, hatchery operators in Southeast Alaska continued to maximize permitted production from their facilities. Increases in chum production of approximately 10 million eggs each occurred at the Macaulay Hatchery (formerly the Gastineau Hatchery), at Hidden Falls Hatchery and at the Medvejie Creek Hatchery. Chinook production was re-instituted at the Port Armstrong Hatchery in 2001.

Loss of Production

The small hatchery at Burro Creek ceased production in 2000. Chinook salmon that continue to return to Burro Creek will be utilized for broodstock development at Macaulay Hatchery. In 2001, the Auke Creek Hatchery also ceased production. Normal variation in broodstock abundance has resulted in fluctuations in annual production from Alaskan hatcheries.

Trends in Production

Most private non-profit hatcheries are nearing their permitted capacities. Relatively small increments of additional chum and coho salmon production have been approved at some hatcheries that will begin to come online in the near future. However, potential eggtakes and releases should increase only slightly over the next few years as hatcheries reach their physical and legally permitted capacities. Returns to hatcheries will fluctuate annually with varying marine survival.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

New Production

No significant new production capacity has been added in Washington State.

Loss of Production

Federal budget reductions for the Mitchell Act mitigation program have not resulted in closure of any more facilities in the lower Columbia River. State funded facilities and programs have been reduced due to budget reductions and the recommendations of the Hatchery Scientific Review Group. The state closed Fox Island Net Pens and McAllister Creek Hatchery as a result. Elsewhere in the state, ESA concerns, fish health policy constraints, and losses in state funding have resulted in modest reductions to chinook, coho, and steelhead production.

Trends in Production

For the short term, production levels are expected to continue on a downward trend. In recent years, budgetary issues have been the dominant factor in changing production levels. The decrease in the Mitchell Act program is the most obvious example of budget driven program changes; however, state funding levels have been variable as well. The full impact of the ESA listing of salmon and steelhead are unknown at the present time; changes in hatchery operations are occurring as a result of ESA and the ultimate level of Washington's production program is unknown.

TREATY TRIBES OF WESTERN WASHINGTON
Reported by: The Northwest Indian Fisheries Commission

New Facilities and Production

No significant increases in production occurred at Western Washington tribal facilities in release year 2000 or 2001.

Loss of Production

There was a significant loss of chum production in 2000 resulting from one of the largest tribal programs not meeting it's egg take goal. Also in release year 2000, there were slight decreases in coho and steelhead production. In 2001, no chinook and coho production programs were discontinued but production levels within several programs were reduced.

Overall Production Trends

Trends in tribal fish production are listed in Table 1. Beginning in 1985, tribal production consistently resulted in releases of salmon and steelhead in excess of 40 million fish. Release year 2000 marked the first year of tribal production, which had dropped significantly below 40 million released. In 2001, a trend of reduced quantities of tribal salmon reared and released was continued.

Table 1. Hatchery Releases for Western Washington Tribes (1,000's of fish). Release numbers include tribal cooperative projects with state, federal and private organizations.

Release Year	Fall Chinook	Spring/ Summer Chinook	Sub-yearling Coho	Yearling Coho	Chum	Pink	Sockeye	Sub-yearling Steelhead	Yearling Steelhead	Total
1985	9,686	422	9,512	6,598	25,190	0	200	1,402	1,252	54,262
1986	11,632	237	2,893	7,536	22,380	0	240	1,159	1,242	47,319
1987	11,080	133	2,584	6957	23,470	0	12	932	978	46,246
1988	13,094	476	1,699	8,150	21,092	882	133	577	905	47,008
1989	12,102	682	2,364	8,033	20,221	0	200	398	872	44,872
1990	14,212	659	1,269	7,693	14,981	110	0	353	821	40,098
1991	15,465	446	2,194	9,458	14,887	0	12	769	903	44,134
1992	12,847	1,105	3,800	11,589	12,417	46	48	339	686	42,877
1993	10,459	900	2,781	8,635	14,167	0	46	144	1,190	38,322
1994	12,125	1,282	1,385	8,444	14,257	0	171	159	847	38,670
1995	14,758	1,376	633	11,243	19,474	0	57	411	1,011	48,963
1996	16,041	1,077	534	9,611	12,595	200	69	1,162	171	41,460
1997	15,203	1,217	1,523	9,449	11,104	0	266	275	916	39, 957
1998	13,252	1,898	627	12,278	11,425	45	188	366	866	40,925
1999	12,510	1,498	741	10,495	16,050	0	69	208	978	42,549
2000	12,569	1,752	560	9,869	7,392	34	258	152	922	33,508
2001	9,471	1,637	524	7,544	9,019	0	1,126	122	776	30,218

OREGON DEPARTMENT OF FISH AND WILDLIFE

New Fish Production

There were no new anadromous fish production programs in 2002 and none are expected in the near future due to lack of funding.

Major Trends

State of Oregon budget problems continue to result in hatchery programs being targeted for closure. This year a projected surplus in license sales dollars allowed the state to maintain operations at 4 coastal hatcheries that were targeted for closure due to a reduction in state general fund dollars. Federal Mitchell Act Program funding shortfalls could also impact hatchery production in the next few of years. A Mitchell Act Program reform package is being submitted again to NOAA Fisheries (Department of Commerce) requesting increased funding to implement new hatchery reform measures and to construct new acclimation sites in the upper Columbia River Basin to enhance survival and reduce straying of specific release groups of hatchery reared fish.

Implementation of the Oregon Plan for Salmon and Steelhead is continuing, emphasizing natural production areas, habitat improvements and cooperative programs to increase naturally produced fish in coastal watersheds. Funding for new innovative hatchery practices is being sought to explore supplementation of diminished populations of coastal salmon and steelhead.

Negotiations by the co-managers continue for the renewal of the Columbia River Fish Management Plan under the US v. Oregon settlement agreement, which expired at the end of 1998.

The summer drought in 2002 resulted in very low water flows and elevated water temperatures at many ODFW hatcheries. This then caused an increase in disease epizootics at several hatcheries, which will reduce smolt release numbers in a number of programs, particularly summer steelhead programs in the Willamette River Basin. The Idaho sockeye program at Bonneville Hatchery has been terminated because of an IHN virus epizootic and reduced water flow available from the well field that the hatchery uses for fish production. IHNV was more prevalent than usual in the Columbia River Basin this year.

IDAHO DEPARTMENT OF FISH AND GAME

New Production

No new production was undertaken in 2000-2001. Captive brood and rearing programs continue at the Eagle Fish Hatchery for both Chinook and Sockeye Salmon. A variety of research continues to be undertaken including cryopreservation of sperm on selected chinook stocks, supplementation studies, and natures-rearing programs at Sawtooth Fish Hatchery.

Production

In Brood Years 1999-2000, spring and summer Chinook salmon brood escapements and egg takes approached full production levels. Smolt releases will be near full capacity at several stations. The 2001-02 Brood Years are expected to be up some for spring and

summer chinook returning to the Clearwater River, South Fork of the Salmon River, and Rapid River, and the upper Salmon River is expected to be closing in on hatchery goals. Water conditions look to be on the decline again with future hatchery production very much dependent upon good water conditions.

Trends in Production

Hatchery production along with natural production have some upward trends due to good out migration conditions with sufficient water flows to aid smolt survival to the ocean. Good ocean conditions have improved some adult survival and abundant stream flow conditions have allowed some hatchery runs to rebound slightly, but are expected to continue to decline over time due to migration corridor constraints. Wild and naturally produced fish continue to hang on but there is little optimism for full recovery in the near future.

UNITED STATES FISH AND WILDLIFE SERVICE

Trends in Production

US Fish and Wildlife Service production continues at around 39 million fish released per year.

2. 2002 ANNUAL REPORT ON THE SALMONID ENHANCEMENT ACTIVITIES OF THE UNITED STATES

This report had not been received by March 31, 2003.

3. 2002 UPDATE REPORT FOR THE SALMONID ENHANCEMENT PROGRAM IN BRITISH COLUMBIA

The Pacific Salmon Treaty between Canada and the United States requires that information be exchanged annually regarding: operation of and plans for existing enhancement projects, plans for new projects, and views concerning the other country's enhancement projects. This report summarizes the enhancement program since the previous report. Included is Appendix 1 containing the year-end status for hatcheries, manned spawning channels and restoration projects showing eggs taken and juveniles released during 2002 and fish presently rearing.

SIGNIFICANT CHANGES IN PROGRAM

Since 2001, the organizational structure for Fisheries and Oceans Canada has been area-based. This structure integrates enhancement activities with programs from other sectors under local direction and delivery. Regional Headquarters continues to play a role in ensuring consistent program delivery between areas and in the development of standards and guidelines.

Area delivery

Area staff are responsible for the operation of hatcheries and manned spawning channels and most habitat restoration projects.

Activities at major hatcheries and manned spawning channels in 2002 are summarized below. Appendix 1 details the year-end status for all hatcheries, spawning channels and restoration projects showing eggs taken and juveniles released during 2002 and fish presently rearing.

SOUTH COAST

East Coast Vancouver Island

BIG QUALICUM: Chum escapement in 2002 was excellent. Escapement and egg deposition in both channel and river were well above target. The proportion of females was near normal at + 40% however high spawning density resulted in above average egg retention. Terminal runs of chinook and coho were good and targets for both stocks were easily attained. Similar to last year, higher numbers of coho adults were released upstream to expand the very successful recreational fishery. Major reconstructionof the Horne Lake Dam was completed during the summer of 2002. The new works will improve river flow control capability and lower the maximum storage level in the lake.

LITTLE QUALICUM: Chum escapement to the Little Qualicum system was excellent in 2002 and the female ratio was back to normal. The chum egg deposition target for the spawning channel was reduced by approximately 30% of previous levels to accommodate increased chinook production. Once again, Chinook returns were very good and targets were easily attained.

CHEMAINUS: Enhancement of chinook was re-established in 2002 in response to depressed returns. Approximately 100k eggs were taken, with half being reared at Nanaimo Hatchery and half at Seasprings Salmon Farm (the contract facility for previous enhancement activity).

PUNTLEDGE: Although returning Chinook numbers were down slightly from 2001, the returns were still well above the average over the past 10 years. Fall Chinook returns were strong enough to support a newly opened fishery in area 14-11. Both summer and fall run Chinook egg targets were reached for the 2nd year in succession. The Summer Chinook egg target included 1,000,000 eggs taken from the Captive Brood stock raised at the Rosewall Creek Hatchery. This was the first year of attaining the 1,000,000 egg target from the captive brood. Coho returns continued to be very strong for the second year in a row, the 3rd highest return since the opening of the hatchery. Pink returns were average for the even year cycle. Pink egg targets for the Puntledge and Tsolum facilities were supplemented with eggs from Quinsam Hatchery leaving most of the returning adults to spawn naturally in the rivers. With a strong return of Chum, a commercial fishery was open off the Comox Bar and a newly created sport fishery was initiated in the Puntledge River. The Chum egg target was easily attained.

West Coast Vancouver Island

CONUMA: Although harvest was good, escapement of chum to streams in Tlupana inlet remained below recent averages and was poor in some. The dry Fall made it very difficult for chum and early coho to enter the rivers. The Conuma River due to

a log jam left its channel and diverted through the bush, again making fish passage difficult. The winter floods have since corrected this problem. Many chum were over ripe and low egg survival is expected. The hatchery was not able to achieve egg targets for the weaker systems (only 10% of targets for the weakest). Production targets for Conuma, Tlupana and Canton chum were met. Chinook escapement to Conuma increased over that in 2001, and may be at its highest levels. The two rain storms in early September were perfect for the chinook to enter the rivers. The Conuma hatchery was asked to do Gold River, Muchalat and Burman chinook since the Gold River PIP Hatchery was down. Chinook escapements to these rivers were low, egg targets were not met but better than in past recent years, and complications developed when adult chinook samples for CWTs and otoliths showed that the Gold River stock may be up to 92% Robertson Creek chinook. Burman chinook will be tagged and Gold River Chinook clipped. Conuma helped with a chinook egg take on the Zeballos River and incubated those eggs along with Conuma stock transplants to the Zeballos. Coho escapements to Conuma were good and production targets were met.

NITINAT: Chum production for 2002 was very good with good catches to the terminal commercial fishery and good escapement numbers to the inside of the lake. However, with record low rainfall for most of the summer and fall, the extremely low water conditions compounded by a substantial turnover in Nitinat lake, resulted in very low numbers of spawning chum adults. Targets were met but lower than last year. Chinook returns were within expectations and well above last years numbers. The Nitinat stock had 55% females and egg deposition appeared good. Hatchery targets for both Nitinat and Sarita Chinook stocks were easily met. Coho escapement numbers and migration were low with little showing until the first week of November when the "fall rains" finally came. And that they did, with close to 1 meter rainfall in 2 weeks! The final tally on coho was down from the record high of last year but still achieved the second highest on record. Nitinat area coho BKD titers are high so all eggs taken are screened. This year the incidence of BKD was the lowest since the screening started 8 years ago while egg survival to second incubation was the highest on record

ROBERTSON CREEK: The chinook return to the Stamp River continues to improve over the poor runs experienced in the late 1990's and 2000. Hatchery egg targets were easily reached with the vast majority of the run made up of age 3 and 4. Both thermal and coded-wire tag marking continue for Stamp chinook. Chinook returns to Nahmint River improved as well and that egg target was also reached. Coho returns to the Stamp were again very good and the production target was easily attained. All brood coho were marked with an adipose clip to facilitate hatchery mark-selective fisheries. As a coho indicator stock, coded-wire tag + adipose clip and coded-wire tag only groups are also released. The hatchery continues to be responsible for applying fertilizer to Great Central Lake continuing the program initiated in the mid-1970's to improve sockeye productivity. The application during the summer of 2002 was cut short due to cost saving measures.

CENTRAL COAST

Northeast Vancouver Island

HOMALCO: Returns from enhanced Coho (Brood 99) were very low, a BKD outbreak just before release (2001) had resulted in most of the production being destroyed. 2001 Brood Coho are doing well, on target for release May 2003. 2002 Coho egg targets were not achieved this year, due to problems with brood capture. Both summer and fall chum runs were fairly strong, but below escapement targets. The hatchery did not achieve egg targets for either summer or fall run chum in 2002, due to brood stock capture and holding problems. Incubation survival of 2002 brood coho and chum has been good.

QUINSAM: Chinook adult escapement was good, but down 15% from 2001. Another significant trend was the reduced number of jacks, down approximately 50% from 2001. Although age data is not final, it appears that the 3 year old male component was also less, which may have implications for future years. One factor that should be noted is the 5 year old return was from a reduced smolt release. Chinook natural spawning in the Campbell increased by 20%, most likely a direct result of intensive habitat restoration and enhancement work done over the past 10 years.

The Quinsam River Coho return met the escapement target, but was down 17% from 2001. A more extensive mark-selective fishery in the ocean and river may have affected the numbers of adults returning. Coho jacks were down significantly (65%), which is of some concern. Very low flows impacted adult migration of all salmon, particularly coho. Peak migration did not occur until mid-November when it finally rained and the river came up. Prior to that, fish were holding in all available pools under very dense conditions which may have affected migration, spawning success, and normal distribution.

Quinsam Pink return met escapement target, but was down by 54% from 2001. Adult migration was limited in the upper Quinsam because of very low flows throughout the fall, and adult passage problems were present at cascades which would normally have been passable. Quinsam Pink eggs were also taken to stock systems in the Baynes Sound area.

Chum escapement to the Campbell River system was very good, and continues to improve. Habitat restoration work in the Campbell, (gravel), was well utilized, and is a leading factor in the increased production of Chums in the system.

The hatchery continues to be involved with the community and B.C. Hydro to improve water flow control and productivity of the Campbell River system. An estuary management plan has been developed with Campbell River municipality and several habitat improvement projects and land purchases within the estuary have been completed. In 2002, swim surveys of the upper Campbell River canyons revealed that most species were spawning on the limited gravel pads placed by provincial staff. Thousands of juvenile trout, steelhead, and coho are now rearing in the canyon pools now supplied with year round flow at adequate rates (as part of WUPs). This forgotten part of the river has the potential to produce a significant number of salmonids, and restore the upper reaches of the Campbell to what it was before the dam was installed.

Central Coast Mainland

SNOOTLI: There were strong returns of adult chum and pink salmon. The target escapement for chum was met, and the number of pinks being near double the target escapement goals. The number of returning chinook was slightly below target escapement, while still supporting a native food fishery, sport fishery and a small commercial fishery. The hatchery was again heavily involved in a project to determine feasibility for Atnarko River chinook as a key stream candidate for Central Coast chinook stocks. After another successful field season, indications are that the Atnarko chinook stock is a suitable candidate for future assessment projects. The coho escapement in the past year appeared to be quite healthy, significantly exceeding the brood year escapement. The hatchery continues to support enhancement efforts for Rivers Inlet chinook stocks. The Rivers/Smiths sockeye recovery facility was filled to capacity from the 2002 broodstock collected.

NORTH COAST

Mainland

KITIMAT: Due to late start-up of eggtake activities in 2002, some chum targets could not be met. Otherwise, all other targets were met or slightly exceeded. Accidental interruption of the incubation water supply to 2001 Brood cutthroat resulted in a very low smolt release this year, but the egg target was met for the 2002 Brood. The facility continues to be quite successful in rebuilding and maintaining strong returns for all of the species that it deals with. The Kitimat River now has a world-class sport fishery, and is a good contributor to commercial catches in both BC and Alaska.

Fulton and Pinkut: Last spring's outmigration of fry (the three channels plus the airlift) exceeded the 100 million target by 184%. Egg-fry survivals greatly exceeded the 50% target at both channels (63% at Fulton and 83% at Pinkut) thanks mainly to the now-completed gravel renovations done at both spawning channels. Last fall, spawner targets for the two major channels at Fulton and Pinkut were met, but with some difficulty and risk. Neither site had any "reserves" of downstream fish to draw upon, which could have been a problem had pre-spawning mortalities occurred at similar rates experienced in previous years. Fortunately this did not happen in 2002, due to cool temperatures, and no major outbreaks of either Ich or Loma. It is forecast that next spring's production from the channels could exceed targets by a similar margin as from the 2001 brood.

This year saw the final release of fed fry from the Fulton Hatchery to the Morrison River, completing a three-year stock conservation initiative done as part of the Strategic Stock Enhancement Program for Upper Skeena coho. Fed fry release targets were exceeded, due to a combination of more eggs actually being taken than originally estimated, and much better egg-to-fry and rearing survival rates than last year. The increased survival rates were a result of improvements to eggtake procedures and water supply.

Queen Charlotte Islands

PALLANT: Pallant Creek Hatchery is operated by the Haida Tribal Society. Total chum returns to Pallant Creek and Mathers Creek were about half the forecast return. Coho returns were average. Remnant chinook from past transplant efforts (1986 - 88

broods) are still persisting. The cost recovery harvest for chum was approximately 27% of the total harvest and for coho was approximately 66% of the total harvest. Egg targets were not met, due to low returns of chum and warmer than normal freshwater temperatures which contributed to relatively poor survival of coho and chinook broodstock.

LOWER FRASER

Lower Fraser River

CHEHALIS: The fall of 2002 coho returns appeared average (est. 40 K), although reduced from the previous year, with intensive sport fishing activity on both the Chehalis and Harrison Rivers. Brood year 2002 chum returns appeared down slightly, with a total escapement to the river estimated at 60 K. Reduced releases of enhanced fry in both contributing brood years was a least partially responsible for the lower return. The return of Harrison white chinook appeared to be normal (100 K range). A healthy return of summer/red chinook led to one of the largest egg takes to date (650 K)

CHILLIWACK: The Chilliwack River Winter Steelhead migration was strong for both wild and hatchery fish. The fishery starts in late December and ends in April. Observed angler success was high, although no creel program was done. Hatchery brood stock /egg targets were met. The Summer Red Chinook sport fishery (Upper Fraser transplants) starts in early July. This remains a small terminal sport fishery, which has seen a modest increase in angler interest over the year. With above average flow conditions to the first week in August, more tended to escape into the hatchery trap. No creel has ever been done, therefore sport angler success is through anecdotal evidence and by casual observation. There were surplus adults to spawning requirement this year at the hatchery trap. The Fall climate was uncharacteristically dry into mid November. As a result we had record low flows. Coho, Fall Chinook and Chum escapements were average to high. These conditions resulted in adult salmon becoming very susceptible to angling pressure as they held in high concentrations in the larger pools and spawning grounds in the mainstem river. The Sport Fishery was large, with anglers putting in ~300,000 hours on the Chilliwack River, which compares to similar hours on the Fraser River for sport Sockeye. The low flows hindered migration to the side channel and tributary spawning grounds for Chum and Coho until the first major freshet, which occurred in mid November. A creel program and carcass enumeration program for Fall Chinook and Coho was conducted during the Fall. Estimated numbers of Fall Chinook and Coho are expected to be average to above average. Chum escapement estimates were not done, but it appears to be average when correlating with number of returns to the hatchery trap and historical data. Hatchery trap returns were approximately 1,200 Summer (transplant) Red Chinook 5,000 Fall Chinook, 54,000 Coho and 16,000 Chum.

INCH: All stocks showed a strong return in 2002. Chum escapement to Inch Creek was 26,000. The Stave River chum escapement was 475,000. All coho returns were strong and subject to an active recreational fishery. The hatchery began rearing Serpentine and Alouette coho stocks from 2001 BY. Nicomekl and Serpentine eggs were taken from brood year 2002 in a partnership with local community groups. The Stave chinook target of 250K eggs was easily met from Stave returns. Conservation

work on Maria Slough chinook continues with an excellent return of 1200 fish in 2002. Mass marking of hatchery coho continues as well as significant marking of chinook and chum for stock assessment.

UPPER PITT: For the spring of 2002, 5.7 M sockeye fry were released from the facility. In addition, an estimated 5.4 M fry were produced from the hatchery-operated Alvin Patterson spawning channel. The preliminary 2002 sockeye escapement estimate is 85,000. Unfortunately, watershed conditions have been severe (numerous freshets) resulting in an estimated egg to fry survival for wild spawners of 5 %.

Given the decrepit state of the original hatchery building, combined with health & safety and remote site staffing concerns, for brood year 2003 sockeye production will be transferred to a new isolation facility at Inch Creek Hatchery. The new facility will produce 2 M fed fry. In addition hatchery staff will continue to operate the Alvin Patterson spawning channel.

CULTUS LAKE SOCKEYE: In response to recent stock status concerns, a captive brood program has been initiated with Cultus Lake sockeye. In the spring of 2002, a portion of the wild smolt migration (brood year 2000) was removed from the system and transferred to Rosewall Creek Hatchery on Vancouver Island. Rosewall was determined to best satisfy the strict criteria for a captive brood station. For brood year 2001, fry resulting from an adult holding/egg-take/incubation program have also been transferred to Rosewall. Since the 2001 fry are progeny of a small broodstock group it is anticipated that some wild smolts will be collected in the spring of 2003 to ensure appropriate genetic diversity amongst captive reared stock. A successful adult holding/egg-take/incubation program was conducted for 2002 BY fish. The program produced 440K eggs from 480 distinct matings. A discrete selection of eggs has been set aside for captive brood purposes and the 'surplus' eggs will be ponded and reared at the Inch Creek isolation facility for a fall release to Cultus Lake. There are 280K eggs on hand at this time.

WEAVER CREEK: For brood year 2001, the egg to fry survival rate was 68%, resulting in 21.2 million fry being produced. For brood year 2002, a strong escapement resulted in both the channel and creek being fully loaded. Even though the parasite *Parvicapsula minibicornis* was again documented to be present in returning adults, the pre-spawning mortality rate remained fairly low at roughly 10%. This resulted in a total egg deposition of over 71 million eggs.

Strait of Georgia Mainland

CAPILANO: Capilano adult chinook and coho returns provided excellent terminal tidal and non-tidal sports fishing opportunities. Coho adult returns to the hatchery itself were higher than average and egg targets were achieved. Chinook returns to the hatchery were below average, most likely due to very low late summer and early fall river water flows. Chinook egg targets were supplemented from the Chilliwack River stock as a result. Low adult steelhead returns to the Capilano River are of continued concern.

TENDERFOOT: The chinook return was the strongest seen and the 1.6 M egg target was met with little difficulty. Pink escapements were higher than any time over the

last 20 years. Coho escapements appear to be better than at any time since the hatchery has been operational. Escapements to Tenderfoot Cr. are particularly strong. Additional coho and chum eggs were taken for fry releases for underseeded habitat restoration projects and PIP projects. 1.0 million pink eggs were transplanted from Indian River to a habitat restoration channel on the Cheakamus River.

BC INTERIOR

Thompson River

Shuswap: Given building escapements to the Middle Shuswap River, only Duteau Creek coho were enhanced in brood year 2002. Strong chinook escapements to both Lower and Middle Shuswap led to egg take targets being obtained. May of 2002 saw the release back to the Upper Adams of 310 K sockeye fry that had been incubated and initial reared at the facility. It is felt that this project will assist greatly in the rebuilding of the sub-dominant cycle. In response to prespawning mortality concerns of late run Fraser sockeye, a variable temperature holding trial was conducted on Lower Adams sockeye adults.

Spius: For the Salmon River, a similar escapement past the fence to that seen in 2001 (>220) resulted in the collection of 130K eggs. This return came from a total brood year escapement estimated at slightly less than one hundred fish. For the three other coho stocks enhanced, strong returns resulted in egg collection targets being attained. For chinook, building escapements led to egg collection targets for the Nicola, Coldwater, Salmon and Spius all being met. For wild production, low flows during migration and spawning will likely result in reduced survivals of all local coho and chinook stocks.

Upper Fraser

Nadina: Following a 38% prespawning mortality rate amongst the fall of 2001 adult spawners, an egg to fry survival rate of just over 40 % resulted in the production of 12.9 M fry. For brood year 2002, a very small escapement led to only 1500 adults being loaded into the channel. Fortunately, prespawning and egg retention rates were very low also.

Regional Headquarters

ENHANCEMENT SUPPORT & ASSESSMENT

Regional Headquarters provides specialized technical support to enhancement projects and a consistent framework for the collection and analysis of enhancement information. The development of enhancement policies and operational guidelines and performance measures and results for reviewing enhancement facilities are key functions of this unit.

OCEANS/WATERSHED PLANNING & RESTORATION

A new Watershed-based Fish Sustainability Planning (WFSP) framework was developed jointly by the federal and provincial governments in 2001 to coordinate the work of agencies, community groups, First Nations and other groups with an

interest in the conservation of the fisheries resource and to provide a consistent collaborative planning approach for identifying priorities in fish sustainability (e.g., enhancement, habitat restoration and protection). Regional Headquarters will coordinate and assist the areas in the development of WFSPs by providing specialized support in habitat restoration, GIS, habitat inventory, database management, water and land use planning.

STEWARDSHIP & COMMUNITY INVOLVEMENT

A Regional Headquarters Unit with a staff of five is responsible for leading the integration and strategic development of core stewardship and community involvement programs for habitat and enhancement activities in the Pacific Region. The Unit is responsible for co-ordination, monitoring and support activities to promote a consistent and strategic approach to the departmental vision for stewardship and community involvement.

The following are some of the key projects underway from 2002:

1. Education

- Complete the development of the 3 year formal oceans and salmon education strategy ("K- grade 12" target audience).
- Co-ordinate delivery of major projects, such as, revision of educational curriculum package, in cooperation with the Areas.

2. Stewardship and Community Involvement programs

- Lead the review of the Habitat Conservation and Stewardship Program (HCSP) which ends March 31, 2003 in terms of lessons learned, developing case studies and field level evaluation tools.
- Support the Pacific Salmon Endowment Fund Technical Committee and provide an ongoing linkage between the department and the Fund.
- Provide regional support to habitat and enhancement area community involvement programs, including Community Economic Development Program (CEDP) and the Public Involvement Program (PIP).
- Manage Habitat Stewardship Program application process under *Species at Risk Act*

3. Partnership Building

- Continue to develop a network between community stewardship partners, volunteers and staff.
- Provide a link to National stewardship/volunteer initiatives and monitor International trends.
- Provide support to the Salmon Enhancement and Habitat Advisory Board (SEHAB), Pacific Streamkeepers (PSkF) and Pacific Salmon Foundation (PSF).

4. Information and Awareness

- Publish community stewardship reports, newsletters, brochures and awareness materials.
- Provide support services to a network of DFO Community Advisors.
- Disseminate information to the Area staff.

LAKE ENRICHMENT PROGRAM

Two major Lake Enrichment projects were carried out in 2002. This technique adds a concentrated nutrient solution to the surface of lakes to stimulate the production of food organisms for sockeye salmon, increasing sockeye production by an estimated 50%. The first project was on Great Central Lake, which has been enriched annually for over 30 years to support the Barkley Sound sockeye fishery. The second project was on Woss Lake, in a cooperative study with the Nimpkish River Management Board to study the complete ecological impact of the enrichment technique. Woss Lake is also a stock rebuilding project.

APPENDIX 1

Status Report as of December 31, 2002 for Hatcheries, Manned Spawning Channels and Restoration Projects

Data presented in this table include: egg targets, eggs taken (or transferred to or from another facility), fry or yearlings rearing as of December 31, 2002, and numbers released by release stage. Note that 2002 brood eggtake numbers are not yet available for all sites.

Releases are grouped by release stage (Unfed Fry, Fed Fry, Smolts or Yearlings).

Reports of the Joint Technical Committees

PART V
REPORTS OF THE JOINT TECHNICAL COMMITTEES

Executive summaries of reports submitted to the Commission by the joint technical committees during the period April 1, 2002 to March 31, 2003 are presented in this section. Copies of the complete reports are available from the library of the Pacific Salmon Commission.

A. JOINT CHINOOK TECHNICAL COMMITTEE

Joint Chinook Technical Committee Report. Relating Risk of Management Error to Lower Bounds of Escapement for Additional Management Action. TCCHINOOK (02)-2. June 10, 2002.

A decision to implement "additional management actions" in a fishing season will be based on the number of stock groups of chinook salmon "requiring response" as per the Agreement:

Percentage Reduction In Index	***Number of Stock Groups Requiring Response***
10%	*2 stock groups*
20%	*3 stock groups*
30%	*4+ stock groups*

For AABM fisheries on chinook salmon the "index" is the pre-season abundance index from a successful calibration of the CTC (Chinook Technical Committee) coast-wide model for the upcoming season; for ISBM fisheries the "index" is the non-ceiling index as defined in TCChinook (96)-1. For both types of fisheries a reduction of x% implies an approximate x% reduction in fishing effort and subsequently a lower fishing-induced mortality rate (harvest rate).

Whether or not a stock group "requires response" depends upon the number of stocks in the group with escapement below a lower bound and a negotiated set of criteria. There are 12 stock groups with each group comprised of one to seven stocks. By the Agreement, only those stocks with biologically based escapement goals accepted by the CTC will be considered when implementing "additional management action" (AMA). To date the CTC has accepted goals for two stock groups, the Fraser Late group (Harrison stock) and the Far North Migrating Oregon Coastal group (Nehalem, Siletz, and Siuslaw stocks). An interim goal based on outputs from the coast-wide model was developed for the mid-Columbia group (and stock). A goal was accepted for the Lewis stock of the Columbia Falls group, but not for the other two stocks in that group. In the Agreement the CTC was tasked with developing methods by the end of 2001 for establishing lower bounds for all stocks that would be used to trigger AMA.

Possible "interim" methods of calculating lower bounds for stocks prior to 2001 were implied in the Agreement and were investigated for their effectiveness as methods for establishing lower bounds. All of these methods were variants of setting lower bounds as a function of estimated, two-parameter stock-recruit relationships. Lower

bounds were judged on how often AMA would be taken, how quickly stock size would "recover," and the effects of AMA on average harvest and average escapements. Simulations based on information from stock assessment programs, exploitation rate analyses, and estimated, three-parameter stock-recruit relationships were used to answer these questions. The third parameter in simulated stock-recruit relationships represented process error and was stochastic. "Interim" approaches were subsequently abandoned when simulations showed AMA is not needed to protect stocks, so long as average harvest rates are no greater than the optimal rate and stock productivity is as estimated and not lower.

Although stocks do not need protection when harvest occurs at or below optimal rates (rates that produce MSY given stock productivity), stocks do need protection if they are being overfished. Overfishing happens when average harvest rates are greater than optimal rates, usually from stock productivity being lower than expected or harvest rates being higher than estimated. Whichever the cause, the appropriate response is to reduce average harvest rates through AMA. Low escapements can result from overfishing, however, low escapements can also result from natural variation in stock abundance when stocks are under or optimally fished as well. Because we do not know which is so, there are risks of doing the wrong thing in setting a lower bound to trigger AMA. These risks of management error can be estimated and used to establish rational lower bounds.

General methods linking lower bounds and the risk of management error were developed that incorporated unexpected changes in productivity and harvest rates. Management error is defined as an unwarranted AMA (a Type I Error) or no AMA when needed (a Type II Error). The former occurs when one or zero stock groups are unknowingly being overfished (no AMA is needed as per the Agreement), yet by chance enough escapements are below established lower bounds to trigger AMA. A Type II Error occurs when two or more stock groups are unknowingly being overfished (AMA is needed as per the Agreement), but by chance too few escapements are below established bounds to trigger AMA.

The link between lower bounds and risk is a matter of probability as implied in the Agreement. Simulations of the Harrison, mid-Columbia, Oregon coastal, and Lewis stocks can be used to estimate the probability that escapement to each stock would meet the "two-year" criterion in a particular year, that is, escapement below a lower bound in the two previous years. Simulations were similar to those developed to investigate the "interim" methods mentioned earlier. Probabilities of each stock in a group meeting its "two-year criterion" are combined to estimate the probability that a stock group "requires response" in a year, then these probabilities are used to estimate the probability that two or more groups "require a response" and trigger AMA. Productivity of stocks was reduced in some simulations and not others to represent situations when no, one, two, or three groups are being overfished. Estimated probability of triggering AMA when one or no groups are being overfished represents a Type I Risk. Estimated probability of not triggering AMA when two or more groups are overfished represents a Type II Risk.

The link between lower bounds and risk can be exercised to estimate risks from a specific set of lower bounds, or to establish lower bounds from acceptable risks. The former approach is demonstrated by estimating the risks of choosing the accepted and interim goals as lower bounds. Under one interpretation of the Agreement [¶9(a)(i)

and Attachments I-V], lower bounds for taking AMA would be established whenever the CTC accepted an escapement goal range as being biologically based. The lower end of this range would be the lower bound for triggering AMA under this interpretation of the Agreement. Since only the goal for the Harrison stock was accepted as a range (75,100 to 98,500), risks were estimated for this demonstration using the lower end of the range for the Harrison stock and the point goals for the other stocks (Table E.1). Risks were estimated when all stocks in no, one, or two groups were being overfished due to a 10, 20, 30, or 40% drop in productivity, while all other stocks were being optimally fished (fished to produce MSY). General results showed:

1) Type I Risk was higher when one stock group was overfished;
2) Type I Risk increased as productivity declined in the one group being overfished; and
3) Type II Risk decreased as more stocks became overfished and/or productivity declined.

Specific results under these same circumstances are that there would be an estimated 98% or greater chance of AMA in a typical year (Table E.2) if the lower bounds in Table E.1 are implemented. If one or no groups are overfished and the others optimally fished, all AMA would be unwarranted as per the Agreement. If two or more groups are overfished and the others optimally fished, management would err only in years with no AMA.

Table E.1. Stock groups, stocks, accepted (or interim) escapement goals, lower bounds as implied in ¶9(a)(i) and Attachments I-V of the Agreement, estimated harvest rates, both optimal and current (average from 1995 – 1999).

Stock Group	Stocks	Accepted (or Interim) Goal	Lower Bound	Optimal Harvest Rate	Current Harvest Rate
Fraser Late	Harrison	75,100	75,000	0.61	0.31
Columbia River Summers	Mid-Columbia Summers	12,141[a]	12,100	0.76	0.30
Oregon Coastals	Nehalem	6,989	7,000	0.72	0.60
	Siletz	2,944	2,900	0.72	0.60
	Siuslaw	12,925	12,900	0.72	0.60
Columbia River Falls	Lewis Upriver Brights Deschutes	5,791	5,800	0.79	0.27

[a] Interim goal past Rock Island Dam.

Table E.2. Estimated risks of management error if the low end of "ranges" about accepted (or interim) goals are used as lower bounds. Stock groups are either optimally fished, or are overfished due to reductions in expected productivity of at least 10%. Note that all stocks with accepted goals are

currently underfished (see Table E.1).

Error	Type of Risk	Estimated Risk
Unneeded AMA	I	≥ 0.976
No AMA when needed	II	≤ 0.016

Currently, stocks with accepted goals are being underfished, that is, their average harvest rates as estimated have been significantly below levels that are estimated to produce MSY (Table E.1). In this current situation, estimates of risk based on optimally fished and overfished stocks are over estimates. Under current conditions, AMA is unlikely even if lower bounds in Table E.1 are implemented.

As mentioned above, the process of linking risk and lower bounds can start with the risk of management error. That risk could be a Type I or Type II Risk, but calculations are easier if the Type I Risk is specified first. An acceptable risk is specified and spread evenly across all stock groups giving each the same probability of "requiring response," provided that all stocks are optimally fished. The probability of a group "requiring response" is then spread among stocks within a group (if needed) to calculate the target probability of a stock meeting the "two-year criterion" in any given year. Next lower bounds are changed in simulations based on optimal fishing until the "predicted" probabilities match "target" probabilities. The result is a set of estimated lower bounds associated with an acceptable Type I Risk. Because a Type I Error also occurs when one stock group is overfished, productivity is lowered for one stock group and risk re-estimated from the previously determined set of lower bounds.

Type II Risks are then estimated from this set of lower bounds under conditions when two or more stock groups are overfished due to reductions in productivity, say reductions of 30, 40, or 50%. Simulations are rerun with these now overfished stock groups while other groups are fished optimally. Because the goal is to present lower bounds as a consequence of risk, this process is repeated on different sets of lower bounds to produce a menu or graph.

Figure E.1 is such a graph linking not only Type II Risk to sets of lower bounds, but Type I Risk as well, for the Harrison, mid-Columbia, Nehalem, Siletz, Siuslaw, and Lewis stocks A straight-edge implement is sufficient to show that if a 20% Type I Risk at most is acceptable (for instance), estimated lower bounds for the six stocks in order would be 22,000; 7,700; 3,050; 2,400; 3,600; and 4,100, as determined off the thin curve labeled "I/40/1" (one group overfished due to a 40% reduction in productivity). If overfishing is not as severe as specified for this curve, the estimated Type I Risk is less than 20% for this set of lower bounds. Note that a Type I Error occurs with AMA in a year when one or no stock groups are overfished.

If a 20% Type II Risk is acceptable (as an example), estimated lower bounds from Figure E.1 are 30,000; 8,800; 3,650; 2,800; 4,500; and 4,550, respectively, as determined from the lines labeled "II/40/2" or "II/30/3" (two groups overfished due to 40% reductions in productivity or three groups overfished due to 30% reductions). Note that a Type II Error occurs with no AMA in a year when two or more stocks are overfished. If only concerned with a 50% reduction in productivity in two groups, or

a 40% reduction in three, lower bounds would be much lower at the same estimated risk. If concerned with a 30% reduction in two groups, lower bounds would be higher.

Since only one set of lower bounds can be implemented, a compromise is needed to be risk averse. Remembering that:

1) Type I Risk is lower when overfishing is less severe in the one overfished group; and
2) Type II Risk is less as more groups are overfished and overfishing is more severe,

Curves in Figure E.1 can be used to determine a set of lower bounds that represent a range of acceptable risks. A straight edge laid parallel to the y-axis determines a set of lower bounds by bisecting risk curves. The result overstates both types of risk as per the rules above, or if some stocks are underfished. Graphs can be drawn for ranges in risk and lower bounds not covered in Figure E.1.

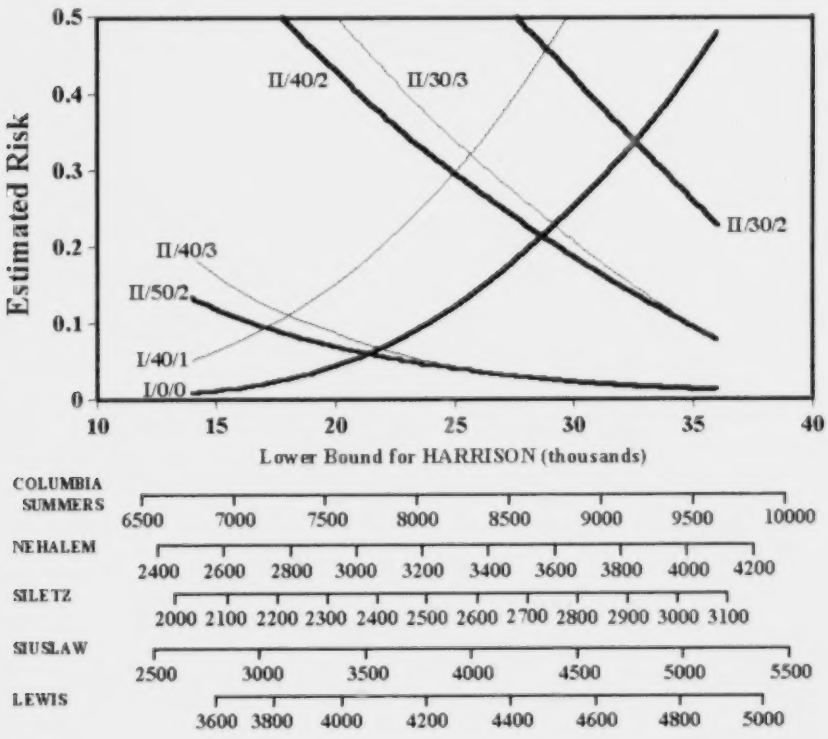

Figure E.1. Estimated risks of management error with sets of lower bounds for the six stocks with accepted or interim escapement goals. Labels on curves have the format "x/y/z" where "x" is the type of risk, "y" is a percent reduction in productivity, and "z" is the number of stock groups being overfished. All stocks not being overfished are assumed to be optimally fished.

Curves in Figure E.1 do not represent the probable, current situation in AABM and ISBM fisheries. As indicated in Table E.2, current average harvest rates for the Fraser Late, mid-Columbia, Oregon Coastal groups, and the Lewis stock are well below their estimated optimal rates. To the extent that these and other stocks are underfished, curves in Figure E.1 overstate both types of risks.

TCCHINOOK (02)-3 - *Annual Exploitation Rate Analysis and Model Calibration.* August 9, 2001.

This report contains the results of the Chinook Technical Committee (CTC) annual exploitation rate assessment and the final pre-season chinook model calibration for 2002 (CLB 0206). Results include the Abundance Indices (AIs) for the Aggregate Abundance Based Management (AABM) fisheries and Individual Stock Based Management (ISBM) Indices for each party, and a summary of pre-season forecast methods by stock.

AABM Abundance Indices and Associated Catches

The AIs for the three AABM fisheries Southeast Alaska All Gear (SEAK), Northern British Columbia Troll and Queen Charlotte Islands Sport (NBC), and West Coast Vancouver Island Troll and Outside Sport (WCVI)) are presented in Table 1. The 1999 Agreement specified that the AABM fisheries were to be managed through the use of the AIs. Pre-season AIs are used to set allowable catch limits for management for the upcoming fishing season. Subsequently, post-season AIs (from the following year's calibration) are specified to be used to track overage and underage provisions. Each calibration provides the first post-season AIs for the previous year and the pre-season AIs for the current year. The first 2001 post-season AIs, and the 2002 pre-season AIs have now been finalized.

Table 1. Abundance Indices for 1999 to 2002 for the SEAK, NBC, and WCVI AABM fisheries.

Year	SEAK		NBC		WCVI	
	Pre-season	Post-season	Pre-season	Post-season	Pre-season	Post-season
1999	1.15	1.12	1.12	0.97	0.60	0.50
2000	1.14	1.10	1.00	0.95	0.54	0.47
2001	1.14	1.29	1.02	1.22	0.66	0.68
2002	1.74		1.45		0.95	

In general, the AIs for 1999 and 2000 are low compared to AIs in the late 1980s and early 1990s but values have increased in 2001 and 2002. The AI values in 2002 are comparable to the higher values in the time series. The Agreement specifies an allowable catch for each AI for each fishery. The specified treaty catch by fishery and year and the actual (observed) catches are shown in Table 2.

Table 2. Observed catches and post-season allowable catches for 1999 to 2001, and pre-season allowable catches for 1999 to 2002, for AABM fisheries in 1999 to 2002 (T=troll; N=net; S=sport).

Pacific Salmon Treaty Allowable and Observed Catches									
	SEAK (T, N, S)			NBC (T, S)			WCVI (T, S)		
Year	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch	Pre-Season Allowable Catch	Post-Season Allowable Catch	Observed Catch
1999	192,750	184,200	200,219	145,600	126,100	80,200	128,300	107,000	31,085
2000	189,900	178,500	186,835	130,000	123,500	35,900	115,500	86,200	100,030
2001	189,900	250,300	189,389	132,600	158,900	40,600	141,200	145,500	114,624
2002	356,500			192,700			203,200		

The 1999 Agreement specifies that overage/underage provisions apply to both AABM and ISBM fisheries. However, in a February 12, 2002 letter to the PSC, the CTC identified major technical obstacles and policy concerns for adjusting harvest levels in response to overage and underages. The major problem identified for AABM fisheries is the confounding of forecast and management error in assessing overages and underages. The pre-season estimates of abundance used to set management goals can be substantially different than the postseason estimates (Tables 1 and 2) due to forecast error. Pre-season target catch levels used to guide managers in setting harvest efforts thus can be quite different from allowable harvest derived from the first post-season calibration (Table 2). As a result, management precision during the fishery differs from the precision of attaining the postseason target. For example, in SEAK the observed catch has been within –1.6% to 3.8% of the pre-season target, but has ranged from 23.8% below to 8.7% above the postseason target.

Until an approach for full implementation has been developed and accepted by the PSC, the Commissioners have instructed the CTC to track overages and underages relative to agreed-upon harvest objectives. Table 3 shows the differential in AABM fisheries between the post-season allowable catch and the observed catch for 1999–2001, and the cumulative differential for those years. All three AABM fisheries have cumulative underages. In SEAK, observed catches have been below final allowable catches for one of the three years; the cumulative differential is –6.0%. In NBC, observed catches have been below the final allowable catches in all three years; the cumulative differential is –61.6%. In WCVI, observed catches have been below allowable catches for two of the three years; the cumulative differential is –27.4%.

Table 3. Differences between observed Treaty catch and the post-season Treaty allowances as number of fish and percentages of allowable catch for AABM fisheries in 1999 to 2001 (T=troll; N=net; S=sport).

Year	SEAK (T, N, S)		NBC (T, S)		WCVI (T, S)	
	Number of Fish	Percent Difference	Number of Fish	Percent Difference	Number of Fish	Percent Difference
1999	+16,019	+8.7%	-45,900	-36.4%	-75,915	-70.9%
2000	+8,335	+3.1%	-87,600	-70.9%	+13,830	+16.0%
2001	-60,911	-24.3%	-118,300	-74.4%	-30,876	-21.2%
Cum.	-36,557	-6.0%	-251,800	-61.6%	-92,961	-27.4%

ISBM Indices

For the ISBM fisheries, the Agreement specified that Canada and the United States would reduce base period exploitation rates on specified stocks by 36.5% and 40.0%, resulting in ISBM indices of 0.635 and 0.60 percent, respectively. This requirement is referred to as the 'general obligation' and does not apply to stocks that achieve their CTC agreed escapement goal. Estimated ISBM fishery indices are shown in Table 4 for Canadian fisheries and Table 5 for U.S. fisheries. Both tables present CWT-based indices for 1999 and 2000, and chinook model-based indices for 1999 through 2002. The agreement specifies that the indices be assessed post season using the CWT based estimates when available.

Both CWT and model based estimates of ISBM indices for a given year can change over time, with the largest changes occurring in more recent years. By necessity, CWT based estimates assume average maturation rates for incomplete broods which contribute to the index in a given year. For example, for calendar year 2000 only brood 1995 is complete ('true' maturation rates used). The youngest brood contributing to the year 2000 index, 1998, will not be complete until 2003, with the analysis done by the CTC in 2004. Other factors effecting the estimates include any changes to the historic CWT database, including the addition of previously unreported CWT recoveries, agency revised CWT expansion factors, or re-estimates of terminal harvest rates of wild stocks. Model based estimates will suffer similar instability, for similar reasons. In addition, model estimates are heavily influenced by pre-season forecasts of abundance at age, while post-season estimates can alter the index for a given year considerably. Model estimates are also influenced by the use of average maturation rates for recent broods and the re-estimation of terminal harvest of wild stocks. While both CWT and model estimates tend to 'stabilize' after two or three years, estimates will continue to vary to some degree as data is updated.

CWT Based Indices in 1999 and 2000

Canadian ISBM indices from the CWT-based estimates in 1999 and 2000 show that exploitation rates were reduced more than required under the agreement for all stocks or stock groups except for the North Puget Sound Natural Spring group. The 2000 index for this stock was 1.176, considerably above the 0.635 standard. While this stock did not meet its agency goal of 2,000 returning adults in the year 2000, the estimated

Canadian ISBM index may be overestimated. It is heavily influenced by recoveries of brood year 1997 Nooksack spring fish in the Strait of Georgia sport fishery (64 of 66 Canadian recoveries occurred there). The 2001 return of Nooksack spring adults was the largest since at least 1984. If the CWTd component survived as well as the natural component of the stock, the estimated age-3 cohort size in 2000 will likely increase when the age-4 CWT data becomes available, and the corresponding ISBM index will decrease.

For U.S. fisheries in 1999, all CWT-based ISBM indices, except for the Stillaguamish River, Green River, and the Lewis River stocks were above the .60 standard. In 2000, the standard was again exceeded for all stocks except the Fraser Late stock, North Puget Sound Natural Spring stock group, and the Stillaguamish and Lewis River stocks. Of the stocks for which the index was exceeded, only the Fraser Late stock met its CTC accepted escapement goal in both 1999 and 2000. However, the Lower Georgia Strait stock group met the DFO interim escapement goal of 7,400 in both 1999 and 2000. Additionally, it is likely that the U.S. index of 3.50, for this stock group, is overestimated. The index is based on CWT recoveries from Capilano and Big Qualicum hatcheries during the base period, and Cowichan recoveries in recent years. These stocks may have dissimilar distributions in U.S. waters, (Cowichan fish being more southerly distributed and more likely to be impacted in U.S. fisheries. See Appendix H).

The estimated index for the North PS Natural Spring stock group of 0.81 in 1999 is based on a total of 17 estimated CWT recoveries in southern U.S. waters of Nooksack spring chinook. That estimate may also decrease as new information becomes available in 2001. While the Green River index in 2000 is 0.70, the Green River adult escapement was above the State-Tribal agreed goal of 5,750 that year.

All CWT-based ISBM indices for the Washington coastal fall natural stock group were above the standard in both 1999 and 2000. No CTC accepted escapement goals currently exist for these stocks, but agency goals are in place for all or most of the stocks in the group. Grays Harbor fall chinook have not met their agency goal of 14,600 natural spawners since 1997. The Queets River fall chinook stock met its management agency goal of 2,500 in 2000, but not in 1999 (1999 escapement was 1,933). The Hoh River fall chinook stocks showed the highest ISBM indices of the group, 1.71 in 1999 and 2.75 in 2000. However, while there is not yet a CTC accepted goal, Hoh River fall chinook have met their management goal of 1,200 natural escapement every year since at least 1976. The Quillayute River fall chinook stock showed the second highest indices in both years. They have exceeded their management goal of 3,000 every year since 1977.

In the Columbia River, ISBM indices were above the standard for all stocks except the Lewis River Wilds. Southern U.S. fisheries were curtailed to protect this stock in 1999 and 2000 due to anticipated low returns. Lewis River wilds did not meet their CTC accepted escapement goal of 5,700 in 1999 (ISBM index of 0.00), but better than predicted returns in 2000 resulted in an escapement well over the goal. Spawning escapements of Upriver Bright chinook exceeded the management goal of 45,000 adults over McNary dam in both 1999 and 2000 by approximately one-third. Deschutes River fall chinook escapements both years were near 3,500, below the management goal of 4,000 adults. Escapements of Columbia Upriver Summer chinook also exceeded the CTC accepted goal in both years.

The CTC has accepted escapement goals for the three stocks in the Far North Migrating Oregon Coastal Fall stock group. All CWT based indices in 1999 and 2000 were above the 0.6 standard. However, all three stocks met or exceeded their goal, except the Nehalem River stock in 2000.

Predicted ISBM Indices for 2002

Predicted ISBM indices for 2002 based on outputs from calibration 0206 are all below 0.635 for Canadian ISBM fisheries for all stock groups.

For U.S. ISBM fisheries, the index for Fraser Late is predicted to be above 0.6. However, Fraser Late escapement is predicted to be well above the CTC accepted goal. Of the five stocks in the Puget Sound Natural Summer/Fall stock group, only the Lake Washington stock has an index predicted to be above the ISBM standard. No CTC accepted goal exists yet for this stock. The predicted exploitation rate on the stock, however, is well under the maximum allowable rate prescribed in the ESA Consultation standard.

Four of the five stocks included in the Washington Coastal Fall Natural stock group are predicted to have ISBM indices above the standard in 2002. None of these stock have CTC accepted goals at this time, and no preseason abundance or escapement predictors are available. Based on a review of the escapements of these stocks, and the generally good survival of chinook predicted on the west coast, it is unlikely that, with the possible exception of Grays Harbor, these stocks will fail to meet their management goals in 2002.

Of the four chinook stocks in the Columbia River, two have CTC accepted escapement goals (Lewis River and Upriver Summers), and both are predicted to exceed those goals in 2002. The indices for both of these stocks exceeds the standard. The index of the Upriver bright stock is also anticipated to exceed the standard. However, its management goal of 46,000 is predicted to be exceeded.

The ISBM indices are predicted to be above the standard for all three stocks in the Far North Migrating Oregon Coastal Fall Stock group. No abundance or escapement predictors are available for the individual stocks in this group. However, the predicted combined escapement of just under 74,000 is over three times the combined CTC accepted escapement goal of 22,858.

Table 4. ISBM Indices for Canadian fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.635 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	Canadian ISBM Indices					
		CWT Indices[1]		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central B. C.	Yakoun, Nass, Skeena, Area 8	NA[2]	NA	0.236	0.264	0.275	0.584
West Coast Vancouver Island	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	0.295	0.083	0.543	0.334	0.242	0.342
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.139	0.119	0.107	0.145
Fraser Late	Harrison River[3]	0.155	0.073	0.350	0.199	0.177	0.302
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	0.194	0.123	0.193	0.121	0.140	0.272
Lower Strait of Georgia	Cowichan	0.346	0.196	0.533	0.510	0.512	0.541
	Nanaimo	0.313	0.154	0.249	0.101	0.121	0.190
North PS Nat Springs	Nooksack, Skagit	0.312	***1.176***	0.257	0.145	0.164	0.195
Puget Sound Natural Summer/Falls	Skagit	NA	NA	0.203	0.113	0.130	0.172
	Stillaguamish	0.157	0.111	0.396	0.230	0.251	0.375
	Snohomish	NA	NA	0.204	0.109	0.119	0.176
	Lake Washington	NA	NA	0.375	0.185	0.213	0.275
	Green River	0.220	0.154	0.375	0.185	0.213	0.275
Washington Coastal Fall Naturals	Hoko, Grays Harbor, Queets, Hoh, Quillayute	NA	NA	0.209	0.154	0.170	0.292
Col River Falls	Upriver Brights	NA	NA	0.138	0.129	0.140	0.429
	Deschutes	NA	NA	0.138	0.129	0.140	0.429
	Lewis[3]	NA	NA	0.056	0.054	0.050	0.171
Col R Summers	Mid-Col Summers[3]	NA	NA	0.135	0.106	0.097	0.198
Far North Migrating OR Coastal Falls	Nehalem[3], Siletz[3], Siuslaw[3]	NA	NA	0.090	0.132	0.148	0.514

[1] The CWT based estimates, not the model estimates, are to be used in post season assessments.
[2] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[3] Stock or stock group with agreed escapement goal.

Table 5. ISBM indices for U.S. fisheries, 1999 through 2001, and the projected indices for 2002. Indices above 0.60 are in italicized bold font for stocks without CTC agreed escapement goals and for stocks that did not achieve CTC agreed escapement goals.

Stock Group	Stock	US ISBM Fisheries					
		CWT Indices[1]		Model Indices			
		1999	2000	1999	2000	2001	2002
North / Central BC.	Yakoun, Nass, Skeena, Area 8	NA[2]	NA	NC[3]	NC	NC	NC
West Coast Vancouver Island[4]	WCVI (Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble)	NA	NA	0.28	0.44	0.28	0.27
Fraser Early	Upper Fraser, Mid Fraser, Thompson	NA	NA	0.09	0.20	0.11	0.15
Fraser Late	Harrison River[5]	0.73	0.13	0.745	0.41	0.41	0.72
Upper Strait of Georgia	Klinaklini, Kakweikan, Wakeman, Kingcome, Nimpkish	NA	NA	NC	NC	NC	NC
Lower Strait of Georgia	Cowichan, Nanaimo	***3.50***	***0.69***	0.19	0.22	0.18	0.22
North PS Nat Springs	Nooksack	0.81	0.00	0.16	0.24	0.13	0.00
	Skagit	NA	NA	ID[6]	ID	ID	0.06
Puget Sound Natural Summer/Falls	Skagit	NA	NA	0.18	0.10	0.13	0.27
	Stillaguamish	0.10	0.04	0.16	0.15	0.11	0.20
	Snohomish	NA	NA	0.05	0.04	0.04	0.15
	Lake Washington	NA	NA	ID	ID	ID	1.25
	Green R	0.59	0.70	ID	ID	ID	0.35
Washington Coastal Fall Naturals	Hoko	NA	NA	0.43	0.33	0.30	0.48
	Grays Harbor	***0.73***	***1.63***	***0.68***	***0.92***	***0.83***	***0.84***
	Queets	***0.95***	***0.85***	***0.88***	***0.15***	***0.87***	***1.05***
	Hoh	***1.71***	***2.75***	***1.40***	***1.21***	***1.25***	***1.26***
	Quillayute	***1.48***	***2.47***	***1.15***	***0.85***	***1.30***	***1.31***
Col River Falls	Upriver Brights	***1.46***	***2.53***	***1.10***	***1.07***	***0.77***	***0.91***
	Deschutes	***0.74***	***0.71***	***0.70***	0.61	0.49	0.55
	Lewis[5]	0.00	0.36	0.14	0.13	***0.66***	***0.93***
Col R Summers	Mid-Col Summers[5]	2.08	4.82	0.46	0.32	0.40	***0.82***
Far North Migrating OR Coastal Falls	Nehalem[5]	1.46	***1.97***	2.09	***2.40***	***2.50***	***2.61***
	Siletz[5]	1.07	1.16	1.23	1.26	***1.29***	***1.33***
	Siuslaw[5]	1.03	2.45	1.54	3.03	***3.19***	***3.34***

[1] The CWT based estimates, not the model estimates, are to be used in post season assessments.
[2] NA means not available because of insufficient data (lack of stock specific tag codes, base period CWT recoveries, etc).
[3] NC means that the current model assumes the stock is not caught in U.S. ISBM fisheries.
[4] Stock group not in Annex Table V.
[5] Stock with agreed escapement goal.
[6] ID means insufficient data available to estimate stock specific impacts.

Overages and Underages

The agreement specifies that overages be accounted for in ISBM fisheries, as well as in AABM fisheries. Estimates of the indices based upon CWTs versus the CTC model based indices can vary substantially. Pre-season ISBM projections for 2002 provide a caution to management agencies for pre-season planning, but there can be considerable uncertainty associated with them. In 2001, the CTC developed several options for implementing overage/underage provisions in both AABM and ISBM

fisheries, and presented the options to the PSC commissioners. The commissioners directed the CTC to monitor and report the indices for evaluation by the PSC commissioners. The number of stocks without CTC-accepted escapement goals emphasizes the need for agencies to provide biologically-based escapement goals and supporting documentation for CTC review.

Stock Forecasts

A summary of recent forecasts for 14 stocks used in the CTC model calibration indicates that the accuracy of individual stock/year forecasts have ranged from 34% to 412% while the average accuracy has ranged from 51% to 175% during the period of 1998–2001. Forecasts for the major production stocks suggest that chinook abundance in 2002 will be greater than that reported for 2001.

The detailed description of trends in escapement has been summarized in the CTC Catch and Escapement report, covering data through 2001 (CTC 2002). The escapement review includes 51 naturally spawning escapement indicator stocks/stock aggregates. Biologically-based escapement goals have been accepted by the CTC for 16 of the 51 escapement indicator stocks/stock aggregates. For 11 of these stocks, the agreed escapement goal is defined as a range; for the remaining 5 stocks, the escapement goal is the point estimate of S_{MSY} (escapement producing maximum sustained yield). In 2001, escapements were within the goal range for 6 stocks, above the range or S_{MSY} point estimate for 9 stocks, and below the goal range for 1 stock.

B. JOINT CHUM TECHNICAL COMMITTEE

No reports were finalized for publication during this reporting period.

C. JOINT COHO TECHNICAL COMMITTEE

No reports were finalized for publication during this reporting period.

D. JOINT NORTHERN BOUNDARY TECHNICAL COMMITTEE

TCNB (02)-3 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002.

This report by the Northern Boundary Technical Committee (NBTC) includes a summary of information on coho salmon stocks and fisheries in the northern Boundary area of Southeast Alaska and northern British Columbia. The stocks, fisheries and management are described while catch and effort statistics are reported through 1998. The report also compares two independent agency assessments of the status of the stocks through 1998 and provides a brief update of trends in marine survival and abundance indicators through 2001. Finally, the report describes recent progress in stock assessment and some additional priorities as indicated in Attachment B of the 1999 Pacific Salmon Treaty which calls for joint development of biological escapement goals and methods of assessing the abundance of Nass and Skeena coho stocks in-season. Major conclusions of the assessment are:

- Northern boundary coho salmon stocks are widely distributed, are primarily of wild origin and are heavily dependent on the freshwater habitat in which they rear for one or two years. While urbanization, agriculture, transportation and mining have had substantial impacts in localized areas, logging in riparian habitat has been the most wide-spread human influence and is expected to lead to declines in smolt production from some systems in both regions for decades. However, much northern coho habitat remains in near-pristine condition.

- Management of coho salmon fisheries in both regions was relatively passive until the 1980s. Management approaches diverged sharply in the 1990s with conservation of upper Skeena coho stocks becoming the foremost priority in Canadian fisheries in 1998. Although several new management policy initiatives have recently been implemented in Canada, changes in Alaskan management have been relatively minor in comparison since the early 1980s.

- During the past three return years, marine survival has improved substantially from mid-1990s levels for coho stocks in northern British Columbia. An apparent shift occurred between 1998 and 1999 in which survival rates in the regions have re-converged after a period of 7-years when survival rates were consistently far higher in Southeast Alaska. Jack predictions for 2002 suggest that while survival of mainland stocks in both regions will be lower than the 3-year average, the relationship in survival between the regions will remain consistent with the recent trend. Preliminary smolt estimates associated with the 2002 return of three wild indicator stocks in the immediate boundary area have improved from recent low levels to near-average, suggesting that improved freshwater production in this area will help offset lower predicted marine survival.

- Improved survival rates and reduced exploitation rates in Canadian fisheries have resulted in escapements in the upper Skeena system during 1999-2001 that were substantially improved over parent years, and in some cases, exceptionally strong.

- Two independent agency reports differed on the status of some northern British Columbia stocks in the general technical areas of abundance trends and underlying causes, as well as current status, and appropriate targets for escapement and exploitation.

- Although Canadian conservation measures and improved marine survival have reduced the immediate urgency for resolution of these outstanding technical questions, recent improvements in assessment programs in both regions are expected to improve concurrence on stock status in future assessments, and to lead to common biological goals. A high priority should be placed on continued development of indicator stocks, including recently initiated projects in the upper Skeena River, the upper Nass River, the Queen Charlotte Islands, central coast areas of British Columbia and in southern Southeast Alaska.

- Recent efforts to develop in-season abundance estimation capability for Nass and Skeena coho stocks using fishery performance and CWT based models (as per PST Attachment B) have yielded promising early results that have already been used in some domestic management plans. Continued development of indicator stock projects, particularly those that estimate smolt production before or during the fishing season, could improve the ability to establish and manage for biological escapement goals.

The following are key points in each section:

1) Description of the Stocks.

Most adult coho salmon in both regions are ages 3 and 4, having spent about 1½ to 2½ years in freshwater and the remaining 16 months or so in the ocean. The stocks are distributed among thousands of individual systems throughout both regions including small streams, lake systems, mainland river valleys and interior tributaries. Rearing coho salmon occupy a wide range of freshwater habitats and are particularly dependent on pools and off-channel areas such as sloughs, ponds and highly structured shoreline areas of lakes. The broadest threat to production of northern coho salmon stocks is clear-cut logging in riparian habitats. Loss of recruitment of dead old-growth timber into stream channels reduces pool habitat needed by coho salmon. Although regulations that protect riparian habitats have improved in both regions, many drainages that were logged under old practices are expected to decline in productivity for coho salmon for many decades. More localized habitat impacts have resulted from urbanization, mining, agriculture, construction of roads and railroads. While many northern coho systems have not been affected by these activities, roads, railroads and agriculture have been detrimental to coho rearing habitat in some drainages, particularly within parts of the Skeena watershed.

Fisheries within northern British Columbia and Southeast Alaska harvest primarily local coho salmon stocks from within the regions, while contributions by stocks in southern British Columbia and states in the Pacific Northwest have been relatively minor. Hatchery contributions have averaged about 20% of the harvest in Southeast Alaska and 7% of the harvest in northern British Columbia in recent years. Stock composition model results from 1987–1994 indicate that approximately 20% of the Southeast Alaska harvest, on average, is from northern British Columbia stocks with nearly all of the remainder contributed by Southeast Alaska and transboundary river stocks. Northern British Columbia catches have averaged about 93% Canadian origin with most of the remainder contributed from Southeast Alaska.

2) Fishery Management.

Commercial fisheries in Southeast Alaska and northern British Columbia were initiated late in the 19th century. Coho salmon lagged sockeye and pink salmon by at least two decades in development of active management programs and with few exceptions, coho salmon were managed passively until the mid-1970s or later in both regions.

The management objective for Southeast Alaska fisheries for coho salmon is to achieve maximum sustained yield from wild stocks. Hatchery contributions are identified in key fisheries in-season so that wild stock abundance can be

independently evaluated from fishery performance. Since the early 1990s, management in Southeast Alaska has been increasingly focused on in-season run strength assessment for indicator stocks and achievement of biological escapement goals. While management still relies on aggregate fishery performance indicators, there has been a trend toward increasing use of direct in-season abundance estimates and escapement projections for wild indicator stocks based on coded-wire tag recoveries and smolt estimates. A secondary management objective for Southeast Alaska fisheries is achievement of a long-term commercial catch allocation objective established by the Alaska Board of Fisheries in 1989: 61% troll, 19% purse seine, 13% drift gillnet and 7% set gillnet. Coho salmon abundance is assessed throughout the season after July 1, with abundance-dependent provisions for an early region-wide troll closure in late July, a mid-August closure of up to 10 days and a 10 day extension of the troll season until September 30. There are also management provisions under the Pacific Salmon Treaty specifically for northern British Columbia stocks in the troll fishery in southern Southeast. Net fisheries are managed under weekly openings that are adjusted in both area and time depending on the run strength of coho salmon and other stocks.

Canadian salmon management policies have been extensively revamped in the last few years with implementation of several policy initiatives including: the Pacific Salmon Revitalization Strategy, specific conservation measures to protect and rebuild coho stocks in the upper Skeena and Thompson Rivers, the Coho Recovery Plan, the New Directions Policy, and An Allocation Framework for Pacific Salmon. Among other objectives, these initiatives have called for and provided funding toward: a 50% reduction in the number of boats in the fleet; an initial target of zero fishing mortality on coho stocks of concern; a precautionary (risk-averse) management approach with conservation as the primary objective; use of selective methods to harvest salmon; a priority for First Nations food, social and ceremonial requirements and treaty fisheries after conservation; an allocation priority for recreational allocation of coho and chinook salmon (after conservation and First Nations needs are met); an independent board to advise and assist in implementation of allocation policy; and a net gain in productive capacity of salmon habitat in British Columbia. The wild salmon policy initiative that is currently underway will be critical in shaping the Canadian management approach in future years. In addition, Canada is developing species at risk legislation that, when implemented, is expected to influence fisheries management.

3) Catch and Effort.

The trend in the commercial catch of coho salmon in Southeast Alaska shows prominent peaks in the 1940s–early 1950s and in the early to mid-1990s that bracket a period of consistently low catches during 1956–1981. In contrast, the catch in northern British Columbia followed a more stable long-term trend from the 1930s through the mid-1990s with a peak occurring in the 1960s when the average annual catch of 1.39 million fish exceeded the average catch in Southeast Alaska (1.14 million).

In Southeast Alaska, the troll fishery is the primary harvester of coho salmon and has accounted for 1.92 million coho salmon on average, or 62% of the commercial harvest during 1989–1998. Southeast Alaska troll effort in boat-days peaked at 59,200 boat days on average in the late-1970s and has since followed a steady

declining trend to less than half of the peak level by 1998. Despite the decrease in fishing effort, the effectiveness of the troll fishery in exploiting Alaskan indicator stocks has remained relatively stable since the early 1980s. The seine fishery has the most stable long-term coho catch trend among the gear types in Southeast, while the drift gillnet catch more than tripled from the 1960s to the 1990s and the Yakutat setnet catch more than doubled. Driven largely by increased charter operations, the recreational catch in Southeast Alaska increased more than the commercial catch in the 1990s and reached a 1994–1998 peak of 163,500 fish, on average, or 5.3% of the combined commercial-sport catch.

In northern British Columbia, the commercial catch declined to an average of 703,000 fish in 1990–1997 from 948,000 in the 1980s and became non-retention in 1998. The troll catch peaked at an average of 758,000 in the 1960s and declined to 531,000 in the 1990s. Troll fishery effort was relatively stable at 36,000 to 41,000 boat-days during the 1960s through 1970s, then increased in 1980 and has since steadily decreased to 1998. Northern British Columbia seine and gillnet effort steadily decreased from the 1960s to 1990s. Like Southeast Alaska, the sport coho harvest grew appreciably as the result of an influx of lodge and charter operations, increasing from 2.5% of the total ocean harvest in the 1980s to 7% in the 1990s.

4) Independent Reports on Stock Status.

Independent reports on the status of northern boundary coho stocks by Holtby (1999) and Shaul and Van Alen (2001) were compared and some suggestions made for programs that would help resolve differences. Several new stock assessment projects have already been initiated since the independent assessments were made. The reports came to substantially different conclusions in four areas: 1) abundance trend indicated by the Tyee test fishery index; 2) nature and cause of the decline in the Babine stock; 3) interpretation of low juvenile and spawner density estimates in the upper Skeena drainage; and 4) analysis of visual estimates.

The primary technical question in interpretation of the Tyee test fishery is whether or not to adjust the coho index for estimated changes in efficiency for sockeye salmon. Resolution of this question is important because the unadjusted index shows a relatively steady decline in aggregate early coho escapement to the Skeena system from the early 1970s through the mid-1990s while the adjusted index follows a stable trend during the same period. Both reports compare the Tyee index with the Babine coho escapement, but come to different conclusions about appropriateness of the sockeye adjustment based on comparisons made over different periods. Uncertainty over interpretation of the early Tyee test fishery index points to the need for improved direct measures of escapement within the upper Skeena system.

Both reports conclude that the Babine stock underwent a major decline in total abundance after 1978, but the reports differ in their characterization of the decline and its probable cause. Escapement numbers used were very close, but reconstructed exploitation rates and catches used to analyze population trends and spawner-recruit relationships differed. Shaul and Van Alen describe a very abrupt (stepped) decline in total run size of 66%, similar to the pattern observed in escapement, while Holtby describes a less severe but more protracted decline in total abundance of 11% per generation from 1970–1998. Shaul and Van Alen describe evidence in the spawner-recruit data of an abrupt decrease in carrying capacity during the 1976–1978 brood

years that they speculate was related to the ecological effects of Babine sockeye enhancement. On the other hand, Holtby describes the decline as an ongoing process that is associated with increased exploitation rates, and concludes that excessive exploitation is the probable cause. Improved information on the distribution of spawners and juveniles within the Babine system would help shed light on some the varying hypotheses for the decline, as would further joint review exploitation rate reconstructions and more recent stock information. Recent extreme escapements that have varied up to 47 fold will provide a useful test of both the intrinsic productivity and carrying capacity of the stock.

Density estimates for juvenile coho salmon sampled in habitats in the upper Skeena drainage have been consistently low compared with levels that are considered by DFO to be indicative of full seeding, based on studies of coastal streams in southern British Columbia (0.75–2 juveniles/m^2). Holtby (1999) considered low densities in the upper Skeena to be evidence that spawning escapements were inadequate to fill available rearing habitat. However, Shaul and Van Alen presented an alternative hypothesis that low densities are typical of lower habitat capability in interior systems. Authors of both reports found that juvenile density estimates were poorly correlated with escapement measurements and agreed that density estimates are difficult to interpret. More extensive indicator stock work appears to provide the best potential to resolve these questions. Direct estimates of spawning escapement and resultant smolt production are needed to resolve questions about the adequacy of spawning escapements in the upper Skeena and the carrying capacity of interior coho habitats relative to coastal streams.

Finally, the authors differed in their use and interpretation of visual estimates of spawning escapement. Shaul and Van Alen put very little weight on the visual estimates. They stated that representative coho escapement estimates from visual counts are difficult to obtain in remote northern coastal systems and are typically of questionable quality. On the other hand, Holtby analyzed trends in the visual estimates and used them as the basis for spawner-recruit relationships. He reported that some stocks, most notably those in Central Coast Area 6 had declined in escapement over the long-term and were chronically well below MSY, while some more northern stocks in Southeast Alaska and Canadian Area 3 were above MSY. Shaul and Van Alen stated concerns that spawner-recruit relationships substantially under-estimate productivity and over-estimate carrying capacity when the time series includes shifts in environmental factors or estimation efficiency. They concluded that the Area 6 data set was likely subject to such errors.

The technical issues surrounding the visual estimates revolve around the following question: when is data good enough to be used and relied upon? It is agreed that serious questions exist about the reliability of the visual estimates for northern coho stocks, but in some areas like the central coast and Queen Charlotte Islands they comprise the only available data source with which to make any assessment. On one hand, the Alaskan authors gave the visual escapement data weighting in proportion to their perception of its dependability as an indicator of stock status. On the other hand, DFO's precautionary management policy mandates that in the face of uncertainty, a declining indicator like the visual escapement estimates for Area 6 be taken at face value with reduced exploitation being perhaps the only controllable remedy. Technical needs to improve resolution and agreement on the status of central coast stocks include establishment of full indicator stocks and development of more

systematic and better-documented visual surveys. Some new stock assessment programs to address these needs are underway.

5) Stock Status Update.

The report provides a very brief update of some of the primary survival and abundance indicators for northern boundary coho stocks. Marine survival rates entered a period of extreme divergence during 1992–1998, with marine survival indicators in northern British Columbia being consistently a small fraction of Southeast Alaska rates. However, during 1999–2001, survival of northern British Columbia indicator stocks has improved substantially by one-third to up to two-fold while key Southeast Alaska stocks have survived at lower average rates that were one-fourth to one-third below the 1992–1998 average.

Wild stock returns to Southeast Alaska in 1999–2001 have continued at levels comparable with the average for the 1980s and 1990s, and escapement goals were consistently met or exceeded. In northern British Columbia, improved marine survival rates combined with conservation measures in Canadian fisheries have resulted in substantial increases in escapement over brood-year levels, with remarkably strong escapements at or near the highest recorded levels observed in some systems.

Jack indicators suggest that the post-1998 pattern of re-convergence in marine survival between the regions will persist in 2002. Marine survival for the Lachmach River in Canadian Area 3 is predicted to be between 9–10% compared with 9–11% for the Taku and Berners Rivers in northern Southeast Alaska. Survival rates in both areas are predicted to be down from 1999–2001 average rates, but while the Lachmach prediction is close to the 1989–2001 average, Alaskan mainland survival rates are predicted to be substantially below longer-term averages. Jack indicators predict considerably higher survival rates on the outer coast of Southeast Alaska compared with inside mainland systems in 2002.

Smolt production associated with the 2002 return has improved to about average abundance for three wild indicators in the immediate boundary area (Hugh Smith Lake, Zolzap Creek, and Lachmach River), up from record lows in the 1999 smolt year (2000 return). Improved freshwater production is expected to help offset lower forecast marine survival rates for mainland stocks in 2002. The total adult return to Lachmach River is predicted to be close to average at 2,800 fish, while the return to Hugh Smith Lake will likely be substantially below average but within the escapement goal range, assuming an average exploitation rate.

6) Stock Assessment Progress and Needs.

The highest priority need for new coho salmon stock assessment projects in the northern Boundary Area is establishment of additional wild indicator stocks. Substantial progress has been made toward that goal in both regions. In Southeast Alaska, new projects have been established in the Unuk River on the mainland north of Ketchikan and on Chuck Creek on the southern outside coast. In central and northern Southeast, projects have been initiated on Slippery Creek on Kuiu Island and the Nakwasina River near Sitka. In northern British Columbia new projects have been initiated on the Slamgeesh River (upper Skeena), Kwinageese (upper Nass), on

two systems on the central coast (West Arm Creek and Martin River), and on the Queen Charlotte Islands (Deena River).

Estimation of total production (smolts and adults) from these and more established indicator stocks over several years at varying levels of escapement will provide the information needed to establish biologically based escapement goals, which can then serve as management objectives. Coded-wire tagging and smolt estimation are important elements of this process that also provide real-time information on stock abundance in support of in-season management. The central coast projects in particular will provide missing and urgently needed information on marine survival, exploitation rates and stock productivity for an area where there has been a long-term decline in visual escapement estimates.

Further work is needed to broaden systematic escapement estimation programs beyond the indicator stocks that form the core assessment program. Substantial recent progress has been made with annual mark-recapture estimation on some major systems including the Nass River and the Bulkley-Morice drainage in the upper Skeena system. In addition, work has been initiated in Canada to intensify and standardize escapement survey programs.

In addition to improvement of basic stock assessment programs, efforts have been made to develop in-season stock assessment capability for Nass and Skeena coho stocks as indicated in the 1999 PST agreement. Aggregate abundance indicators based on catch-per-unit-effort have proven useful as predictors of abundance of a number of stocks in Southeast Alaska and northern British Columbia. Troll and gillnet fishery performance in the areas adjacent to Dixon Entrance are available early in the season and have been closely correlated with abundance of specific upper Skeena indicators. In addition, the cumulative recovery rate of coded-wire tags (as a percentage of tagged smolts released) has proven to provide useful in-season estimates of marine survival of specific stocks in the Nass, Skeena and Lachmach Rivers as well as several Southeast Alaska systems. We anticipate that in-season stock assessment capability based on coded-wire tags will be expanded to new indicator stocks as they are developed. While coded-wire tag recoveries provide useful in-season survival estimates, accurate real-time smolt estimates for more indicator stocks would improve in-season estimation of total abundance.

TCNB (02)-3 appendix 1 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002. *Appendix One.*

TCNB (02)-3 appendix 2 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002. *Appendix Two.*

E. JOINT TRANSBOUNDARY TECHNICAL COMMITTEE

No reports were finalized for publication during this reporting period.

F. JOINT TECHNICAL COMMITTEE ON DATA SHARING

No reports were finalized for publication during this reporting period.

G. JOINT SELECTIVE FISHERY EVALUATION COMMITTEE

No reports were finalized for publication during this reporting period.

Publications of the Pacific Salmon Commission

PART VI
PUBLICATIONS OF THE PACIFIC SALMON COMMISSION

Documents listed herein are available to domestic fishery agencies of Canada and the United States, research organizations, libraries, scientists and others interested in the activities of the Commission, through the offices of the Secretariat, 600 - 1155 Robson Street, Vancouver, B.C., V6E 1B5. Photocopying charges may be levied for documents which are out of print.

Reports published by the Pacific Salmon Commission after March 31, 2000 including Commission annual reports, annual reports of the Fraser River Panel, Joint Technical Committee reports and technical reports of the Pacific Salmon Commission are also available in full text format on the Commission's website at www.psc.org.

Documents listed here are those which were published during the period from 2001/02 inclusive. For previous publications, please refer to the Pacific Salmon Commission 1994/1995 Tenth Annual Report and 1999/2000 Fifteenth Annual Report, or contact the Pacific Salmon Commission Library.

A. ANNUAL REPORTS

17. Pacific Salmon Commission 2001/2002 Seventeenth Annual Report. March 2003.

B. REPORTS OF JOINT TECHNICAL COMMITTEES

i. Joint Chinook Technical Committee

38. Erratum TCCHINOOK (02)-1 - *Catch and Escapement of Chinook Salmon under Pacific Salmon Commission Jurisdiction, 2001.* February 2002. Revised June 18, 2002.

39. TCCHINOOK (02)-2 - *Relating Risk of Management Error to Lower Bounds of Escapement for Additional Management Action.* June 2002.

40. TCCHINOOK (02)-3 - *Annual Exploitation Rate Analysis and Model Calibration.* August 9, 2001.

ii. Joint Chum Technical Committee

No reports were finalized for publication during this reporting period.

iii. Joint Coho Technical Committee

No reports were finalized for publication during this reporting period.

iv. Joint Data Sharing Technical Committee

No reports were finalized for publication during this reporting period.

v. Joint Northern Boundary Technical Committee

24. TCNB (02)-3 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002.

25. TCNB (02)-3 appendix 1 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002. *Appendix One.*

26. TCNB (02)-3 appendix 2 - *Status of Coho Salmon Stocks and Fisheries in the Northern Boundary Area.* July, 2002. *Appendix Two.*

vi. Joint Transboundary Technical Committee

No reports were finalized for publication during this reporting period.

vii. Selective Fishery Evaluation Committee

No reports were finalized for publication during this reporting period.

C. REPORTS OF THE FRASER RIVER PANEL

No reports were finalized for publication during this reporting period.

D. TECHNICAL REPORT SERIES OF THE PACIFIC SALMON COMMISSION

11. Xie, Y., T.J. Mulligan, J.M.W. Cronkite, and A. P. Gray. *Assessment of potential bias in hydroacoustic estimation of Fraser River sockeye and pink salmon at Mission, B.C.* PSC Tech. Rep. No. 11, 2002.

12. Gable, J. *A Comparison of Estimates of First nations Catches of Fraser River Sockeye Salmon from 1996 to 1999 by Scale-based Discriminant Function Models and Run Reconstruction Models.* PSC Tech. Rep. No. 12, 2003.

E. PUBLICATIONS BY PACIFIC SALMON COMMISSION SECRETARIAT STAFF

No reports were finalized for publication during this reporting period.

F. REPORTS OF THE INTERNATIONAL PACIFIC SALMON COMMISSION

Responsibility for maintenance of the library of the International Pacific Salmon Fisheries Commission, on its termination December 31, 1985, was transferred to the Pacific Salmon Commission. Documents in the Library include historical archival papers which are available to researchers and other interested parties through contact with the Pacific Salmon Commission's Librarian.

Publication of John F. Roos' History of the International Pacific Salmon Fisheries Commission, and P. Gilhousen's Estimation of Fraser River Sockeye Escapements ended all publication series of the International Pacific Salmon Fisheries Commission. Copies of all in-print Progress Reports and Bulletins of the International Pacific Salmon Fisheries Commission are available free of charge through the Library of the Pacific Salmon Commission. Copies of the History of the International Pacific Salmon Fisheries Commission may also be ordered through the Library of the Pacific Salmon Commission.

G. DOCUMENTS SUBMITTED BY THE PARTIES

In compliance with provisions of the Treaty, the Parties provide annual post-season fishery reports and updates on their respective salmonid enhancement programs to the Commission. Documents received during 2001/02 were:

1. *2002 Post Season Report for Canadian Treaty Limit Fisheries.* Canada Department of Fisheries and Oceans. December 6, 2002.

2. *2002 Post Season Report for United States Salmon Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 2002.

3. *2002 Update Report for the Salmonid Enhancement Program in British Columbia.* Fisheries and Oceans Canada. March, 2003.

Report of the Auditors for 2002/2003

PART VII
AUDITORS' REPORT AND FINANCIAL STATEMENTS FOR THE PERIOD APRIL 1, 2002 TO MARCH 31, 2003

Financial Statements of

PACIFIC SALMON COMMISSION

Years ended March 31, 2003 and 2002

KPMG

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AUDITORS' REPORT TO THE COMMISSIONERS

We have audited the statement of financial position of the Pacific Salmon Commission as at March 31, 2003 and the statements of financial activities and fund balances and cash flows for the year then ended. These financial statements are the responsibility of the Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Commission, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Commission as at March 31, 2003 and the results of its operations and its cash flows for the year then ended in accordance with the Financial Regulations of the Commission as described in note 2 to the financial statements.

These financial statements and our report thereon have been prepared for filing with the Federal Governments for both Canada and the United States of America in accordance with requirements of the Treaty between the Government of Canada and the Government of the United States of America concerning Pacific Salmon ratified on March 18, 1985 and renewed on June 30, 1999 and may not be appropriate for other purposes.

KPMG LLP

Chartered Accountants

New Westminster, Canada
May 16, 2003

PACIFIC SALMON COMMISSION

Statements of Financial Position

March 31, 2003 and 2002

	General Fund (note 4)	Working Capital Fund	Test Fishing Fund	Special Research Fund	Capital Assets Fund	2003 Total	2002 Total
Assets							
Current assets:							
Cash	$ 182,902	$ 105,222	$ 504,831	$ 127,250	$ -	$ 920,205	$ 1,222,875
Accounts receivable	50,604	-	-	-	-	50,604	62,233
Interest receivable	1,173	-	-	-	-	1,173	169
Prepaid expenses	15,177	-	-	-	-	15,177	14,329
	249,856	105,222	504,831	127,250	-	987,159	1,299,606
Accrued benefit asset (note 6)	11,565	-	-	-	-	11,565	16,177
Capital assets (note 3)	-	-	-	-	212,857	212,857	228,637
	$ 261,421	$ 105,222	$ 504,831	$ 127,250	$ 212,857	$ 1,211,581	$ 1,544,420
Liabilities and Net Assets							
Current liabilities:							
Accounts payable and accrued liabilities	$ 93,022	$ -	$ -	$ -	$ -	$ 93,022	$ 114,421
Deferred revenue	-	-	-	-	-	-	673,000
	93,022	-	-	-	-	93,022	787,421
Net assets	168,399	105,222	504,831	127,250	212,857	1,118,559	756,999
	$ 261,421	$ 105,222	$ 504,831	$ 127,250	$ 212,857	$ 1,211,581	$ 1,544,420

See accompanying notes to financial statements.

Approved on behalf of the Commission:

_"J. Davis"_____ Chair, Standing Committee on Finance and Administration

_"R. Rousseau"_____ Vice-Chair, Standing Committee on Finance and Administration

PACIFIC SALMON COMMISSION

Statements of Financial Activities and Fund Balances

Years ended March 31, 2003 and 2002

	General Fund	Working Capital Fund	Test Fishing Fund	Special Research Fund	Capital Assets Fund	2003 Total	2002 Total
Net assets, beginning of year	$ 185,830	$ 87,037	$ 255,482	$ 13	$ 228,637	$ 756,999	$ 815,763
Revenue:							
Contributions from contracting parties	2,693,476	-	-	540,537	-	3,234,013	2,408,000
Interest	16,802	2,259	-	-	-	19,061	30,051
Gain (loss) on disposal of capital assets	(5,792)	-	-	-	-	(5,792)	825
Other	990	-	-	-	-	990	6,398
Test fishing	1,447,865	-	-	-	-	1,447,865	936,662
	4,153,341	2,259	-	540,537	-	4,696,137	3,381,936
Expenditures:							
Amortization	-	-	-	-	113,326	113,326	127,842
Salaries and employee benefits	1,914,107	-	-	-	-	1,914,107	1,780,064
Travel and transportation	95,924	-	-	-	-	95,924	109,945
Rents and communication	100,992	-	-	-	-	100,992	115,160
Printing and reproductions	3,057	-	-	-	-	3,057	2,850
Contract services	460,530	-	-	-	-	460,530	430,978
Materials and supplies	54,325	-	-	-	-	54,325	42,694
Foreign exchange	15,480	-	-	-	-	15,480	-
Test fishing	1,163,536	-	-	-	-	1,163,536	731,180
Consultant contracts	-	-	-	413,300	-	413,300	99,987
	3,807,951	-	-	413,300	113,326	4,334,577	3,440,700
Excess (deficiency) of revenue over expenditures	345,390	2,259	-	127,237	(113,326)	361,560	(58,764)
Transfer to Working Capital Fund	(15,926)	15,926	-	-	-	-	-
Transfer to Test Fishing Fund	(284,328)	-	284,328	-	-	-	-
Transfer to Capital Asset Fund	(62,567)	-	(34,979)	-	97,546	-	-
Net assets, end of year	$ 168,399	$ 105,222	$ 504,831	$ 127,250	$ 212,857	$ 1,118,559	$ 756,999

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Statements of Cash Flows

Years ended March 31, 2003 and 2002

	2003	2002
Cash provided by (used in):		
Operations:		
Excess (deficiency) of revenue over expenditures	$ 361,560	$ (58,764)
Items not involving cash:		
Amortization	113,326	127,842
Reduction (increase) in accrued benefit asset	4,612	(16,177)
Net change in non-cash operating working capital	(684,622)	558,822
	(205,124)	611,723
Investing:		
Additions to capital assets	(97,546)	(134,208)
Increase (decrease) in cash	(302,670)	477,515
Cash, beginning of year	1,222,875	745,360
Cash, end of year	$ 920,205	$ 1,222,875

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Notes to Financial Statements

Years ended March 31, 2003 and 2002

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1. Nature of organization:

The Pacific Salmon Commission was established by Treaty between the Governments of Canada and the United States of America (the "Contracting Parties") to promote cooperation in the management, research and enhancement of Pacific salmon stocks. The Treaty was ratified on March 18, 1985 and renewed on June 30, 1999, and the Commission commenced operations on September 26, 1985.

2. Significant accounting policies:

(a) Basis of accounting:

These financial statements present the financial position and results of operation of the Commission to comply with the requirements of the Treaty between the Government of Canada and the Government of the United States of America concerning Pacific Salmon and may not be appropriate for other purposes. As required, the financial statements are prepared on an accrual basis except that purchase order expenditures are recognized at the time that the commitment for goods and services are made, rather than at the time that the goods or services are delivered.

(b) Fund accounting:

The Commission follows fund accounting procedures, giving recognition to restrictions on the use of resources specified by the Contracting Parties. The Fund classifications are as follows:

(i) The General Fund includes funds provided annually through contributions from the contracting parties and any net surplus obtained through the test fishing program. By agreement of the Parties, any unexpended balance remaining at the end of one fiscal year may be used to offset contributions in the following year or may be used to offset a shortfall between contributions and approved expenditures in the following year.

(ii) The Capital Assets Fund reflects the Commission's capital asset transactions. Amortization is charged to the Capital Fund.

(iii) The Working Capital Fund represents monies contributed by the Parties to be used temporarily pending receipt of new contributions from the Parties at the beginning of a fiscal year, or for special programs not contained in the regular budget but approved during the fiscal year. Any surplus above a pre-determined fixed limit in the account at the end of the fiscal year is transferred to the General fund and is treated as income.

(iv) The Test Fishing Fund is established as a revolving fund in which a portion of net test fishing revenues realized in years of high abundance are reserved to be used to support test fishing programs in year of low abundance and when conservation concerns are an issue.

(v) The Special Research Fund represents monies set aside to fund additional programs as determined by the Contracting Parties, including late run Sockeye initiatives and studies related to Coho and Chinook salmon.

2. Significant accounting policies (continued):

(c) Revenue recognition:

The Commission follows the restricted fund method of accounting for contributions from Contracting Parties. Externally restricted contributions are recognized as revenue in the year in which they are received and the related expenses are incurred. Unrestricted contributions or other income are recognized as revenue when the amount can be reasonably estimated and collection is reasonably assured.

(d) Trust funds:

The Commission administers several trust funds, as described below:

(i) The Northern Boundary and Transboundary Rivers Restoration and Enhancement Trust Fund and the Southern Boundary Restoration and Enhancement Trust Fund reflect funding held in trust by the Commission. Accordingly, the trust funds' balances of activities for the year have been excluded from the Commission's financial statements. Expenditures are incurred by the Commission as directed by the respective fund committees. Schedules 1 and 2 provide details of these trust funds' balances and activities for the year.

(ii) The Yukon River Salmon Restoration and Enhancement Trust Fund reflects funding provided for a separate entity, the Yukon River Panel. Accordingly, the trust funds' balances of activities have been excluded from the Commission's financial statements. Schedule 3 provides details of the trust funds' balance and activities for the year.

(e) Portfolio investments:

Portfolio investments are recorded at lower of cost and other than temporary decline in market value.

(f) Capital assets:

Capital assets are stated at cost. Costs of repairs and replacements of a routine nature are charged as a current expenditure while those expenditures which improve or extend the useful life of the assets are capitalized. Amortization is provided using the straight-line method of rates sufficient to amortize the costs over the estimated useful lives of the assets. The rates of amortization used on an annual basis are:

Automobiles	20%
Boats	20%
Computer equipment and software	30%
Equipment	20%
Furniture and fixtures	10%
Leasehold improvements	10%

2. Significant accounting policies (continued):

(g) Income taxes:

The Commission is a non-taxable organization under the Privileges and Immunities (International Organizations) Act (Canada).

(h) Post-employment benefits:

The Commission provides certain employee future benefits, including a defined benefit pension plan, which is funded by the Commission on an annual basis, and severance, life insurance and medical benefits, which are funded by the Commission as they become due.

The Commission accrues its obligations under employee benefit plans and the related costs as benefits are earned, net of returns on plan assets.

The Commission's policies are as follows:

(i) The cost of retirement benefits earned by employees is actuarially determined using the projected benefit method prorated on service and management's best estimate of expected plan investment performance, salary escalation and retirement ages of employees.

(ii) The expected interest cost on any prior service obligation is calculated using management's estimate for the long-term rate of return.

(iii) The expected return on plan assets is calculated at a market-related value for the assets.

(iv) Any cumulative unrecognized actuarial gains and losses in excess of 10% of the projected benefit obligation will be amortized over the expected average remaining service life of the employee group covered by the program.

(v) As at April 1, 2000, the Commission had an estimated transition asset of $26,854, which is being amortized over 15 years, which is the expected average remaining service life of the related employee group.

(i) Foreign exchange translation:

Transactions originating in foreign currencies are translated at the exchange rate prevailing at the transaction dates. Assets and liabilities denominated in foreign currency at the balance sheet date are translated to equivalent Canadian amounts at the current rate of exchange. Foreign exchange gains and losses resulting from translation are included in the determination of excess or deficiency of revenue over expenditures.

2. Significant accounting policies (continued):

(j) Use of estimates:

The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant areas requiring the use of management estimates relate to the determination of the valuation of accounts receivable, useful lives of capital assets for amortization and accrued liabilities. Actual results could differ from those estimates. Adjustments, if any, will be reflected in operations in the period of settlement.

3. Capital assets:

	Cost	Accumulated amortization	2003 Net book value	2002 Net book value
Automobiles	$ 192,503	$ 147,240	$ 45,263	$ 28,228
Boats	96,045	82,518	13,527	8,132
Computer equipment	531,395	471,481	59,914	68,335
Computer software	134,606	127,313	7,293	5,534
Equipment	631,190	586,282	44,908	71,396
Furniture and fixtures	259,086	241,767	17,319	18,670
Leasehold improvements	56,628	31,995	24,633	28,342
	$ 1,901,453	$ 1,688,596	$ 212,857	$ 228,637

4. General fund balance:

The Commission has approved a carryover of the unexpended funds in the General Fund to be utilized as follows:

	2003	2002
Continuing operations	$ 153,222	$ 171,501
Reserve for prepaid expenses	15,177	14,329
	$ 168,399	$ 185,830

5. Contracting parties:

The Commission's only related parties are the Contracting Parties.

During 2003, the Commission received contributions from Contracting Parties totaling $3,234,013 (2002 - $2,408,000). The Commission made no expenditures on behalf of the Contracting Parties during the year.

6. Employee benefits:

The Commission has a defined benefit plan providing pension and other retirement and post-employment benefits to most of its employees. The amounts presented in this note are actuarial-determined projections:

	Pension Plan	
	2003	2002
Reconciliation of accrued benefit asset (obligation):		
Opening balance	$ (3,823,336)	$ (3,520,981)
Current service cost	(157,664)	(158,431)
Benefits paid	148,929	98,047
Interest cost	(272,461)	(241,971)
Actuarial loss	(340,163)	-
Ending balance	$ (4,444,695)	$ (3,823,336)
Reconciliation of plan assets:		
Opening balance	$ 3,937,070	$ 3,729,320
Actual return on plan assets	(151,537)	149,915
Employer contributions	86,098	92,405
Employee contributions	71,566	66,026
Benefits	(148,929)	(98,047)
Adjustment	-	(2,549)
Ending balance	$ 3,794,268	$ 3,937,070
Fund status - surplus (deficit)	$ (650,427)	$ 113,734
Unamortized transitional obligation and actuarial gain	661,992	(97,557)
Accrued benefit asset	$ 11,565	$ 16,177
Discount rate	6.5%	7%
Expected long-term rate of return on plan assets	7%	7%

6. Employee benefits (continued):

The plan asset portfolio currently comprises equity investments and debt. Equity investments are 56.5% of the portfolio and include Canadian, International and real estate investments. Debt is 43.5% of the portfolio and comprises short-term debt, bonds and mortgages. Asset mix is reviewed periodically and may vary in the future.

The Commission's net benefit plan expense is as follows:

	2003	2002
Current service cost (less employee contributions)	$ 86,098	$ 92,405
Interest cost	272,461	241,971
Expected return on plan assets	(275,901)	(263,166)
Amortization of transitional asset, actuarial gains and losses	(1,791)	(1,790)
Actuarial adjustment	-	2,549
Net benefit plan expense	$ 80,867	$ 71,969

7. Financial instruments:

The financial instruments consist of amounts receivable, interest receivable and amounts payable and accrued liabilities. The carrying amounts of these financial instruments are a reasonable estimate of their fair values.

8. Trust funds:

(a) Northern Boundary and Transboundary Rivers Restoration and Enhancement Trust Fund:

The Commission holds contributions in trust for this Fund. The income earned on these contributions is distributed by the Commission as directed by the Northern Enhancement Committee. Schedule 1 provides details of this trust fund's balances and activities for the year.

(b) Southern Boundary and Transboundary Restoration and Enhancement Trust Fund:

The Commission holds contributions in trust for this Fund. The income earned on these contributions is distributed by the Commission as directed by the Northern Enhancement Committee. Schedule 2 provides details of this trust fund's balances and activities for the year.

(c) Yukon River Salmon Restoration and Enhancement Trust Fund:

The Commission receives funding in trust for a separate entity, the Yukon River Panel. Funds received are transferred to the Yukon River Panel as directed by the funding parties. Schedule 3 provides details of this trust fund's balances and activities for the year.

8. Trust funds (continued):

Summary of trust fund balances and activities:

	2003	2002
Assets:		
Cash and short-term investments	$ 145,702,648	$ 157,298,222
Interest receivable	-	3,768
	$ 145,702,648	$ 157,301,990
Liabilities and Net Assets:		
Accounts payable and accrued liabilities	$ 177,842	$ 95,598
Fund balance	145,524,806	157,206,392
	$ 145,702,648	$ 157,301,990
Summary of activities:		
Fund balance, beginning of year	$ 157,206,392	$ 95,724,598
Contributions	-	64,434,206
Investment income (loss)	(6,026,726)	34,213
Foreign exchange loss	(4,574,165)	(1,896,699)
Fund expenditures	(1,080,695)	(1,089,926)
Fund balance, end of year	$ 145,524,806	$ 157,206,392

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AUDITORS' REPORT ON SUPPLEMENTARY INFORMATION TO THE COMMISSIONERS

We have audited and reported separately herein on the financial statements of Pacific Salmon Commission as at and for the year ended March 31, 2003.

Our audit was conducted for the purpose of forming an opinion on the consolidated financial statements taken as a whole. The current year's supplementary information included in Schedules 1 through 3 is presented for purposes of additional analysis and is not a required part of the financial statements. Such supplementary information has been subjected to the auditing procedures applied in the audit of the financial statements and, in our opinion, is fairly stated in all material respects in relation to the financial statements taken as a whole.

KPMG LLP

Chartered Accountants

New Westminster, Canada

May 16, 2003

PACIFIC SALMON COMMISSION

Trust Fund Balances and Activity

Schedule 1

Northern Boundary and Transboundary Rivers Restoration
and Enhancement Trust Fund
(stated in Canadian Funds)

March 31, 2003 and 2002

	2003	2002
Assets		
Cash and term deposits	$ 362,662	$ 1,415,956
Portfolio investments (market value - $62,296,155)	72,479,720	77,227,112
Interest receivable	-	1,884
	$ 72,842,382	$ 78,644,952
Liabilities		
Accounts payable and accrued liabilities	$ 88,921	$ 47,799
Fund balance	72,753,461	78,597,153
	$ 72,842,382	$ 78,644,952
Summary of Activity		
Fund balance, beginning of year	$ 78,597,153	$ 47,849,907
Revenue:		
Contributions	-	31,985,939
Interest earned on term deposits	4,494	12,444
Other income	1,495	-
Realized gain (loss) on investments	(3,019,026)	4,664
	(3,013,037)	32,003,047
Expenditures:		
Salaries and benefits	58,332	22,048
Travel and accommodation	16,352	19,282
Rents and communications	479	927
Contract services	467,181	269,512
Materials and supplies	-	3,423
	542,344	315,192
Net activity before foreign exchange adjustment	(3,555,381)	31,687,855
Foreign exchange loss	(2,288,311)	(940,609)
Fund balance, end of year	$ 72,753,461	$ 78,597,153

PACIFIC SALMON COMMISSION

Trust Fund Balances and Activity — Schedule 2

Southern Boundary Restoration and Enhancement Trust Fund
(stated in Canadian Funds)

March 31, 2003 and 2002

	2003	2002
Assets		
Cash and term deposits	$ 368,369	$ 1,415,112
Portfolio investments (market value - $62,306,622)	72,491,897	77,240,042
Interest receivable	-	1,884
	$ 72,860,266	$ 78,657,038
Liabilities		
Accounts payable and accrued liabilities	$ 88,921	$ 47,799
Fund balance	72,771,345	78,609,239
	$ 72,860,266	$ 78,657,038
Summary of Activity		
Fund balance, beginning of year	$ 78,609,239	$ 47,874,691
Revenue:		
Contributions	-	31,985,847
Interest earned on term deposit	4,349	12,445
Other income	1,495	-
Realized gain (loss) on investments	(3,019,533)	4,660
	(3,013,689)	32,002,952
Expenditures:		
Salaries and benefits	58,331	22,048
Travel and accommodation	9,959	10,897
Rents and communications	479	704
Contract services	469,492	275,242
Materials and supplies	90	3,423
	538,351	312,314
Net activity before foreign exchange	(3,552,040)	31,690,638
Foreign exchange loss	(2,285,854)	(956,090)
Fund balance, end of year	$ 72,771,345	$ 78,609,239

PACIFIC SALMON COMMISSION

Trust Fund Balances and Activity

Schedule 3

Yukon River Salmon Restoration and Enhancement Trust Fund
(stated in Canadian Funds)

March 31, 2003 and 2002

	2003	2002
Assets		
Cash and term deposits	$ -	$ -
Interest receivable	-	-
	$ -	$ -
Liabilities		
Accounts payable and accrued liabilities	$ -	$ -
Summary of Activity		
Fund balance, beginning of year	$ -	$ -
Revenue:		
Contributions	-	462,420
Expenditures:		
Transfers to the Yukon River Panel	-	462,420
Fund balance, end of year	$ -	$ -

Appendices

Appendix A

Yukon Agreement

Canadian Embassy Ambassade du Canada

Washington, December 4, 2002

The Honourable Colin L. Powell
Secretary of State
U.S. Department of State
Washington, D.C.

Note No.0098

Excellency,

I have the honour to refer to the negotiations that have been underway since 1971 concerning the conclusion of a long term agreement for the conservation of salmon stocks originating in the Yukon River in Canada and to propose an Agreement between our two Governments comprising the following elements:

1. Pursuant to Article XIII of the Pacific Salmon Treaty, done at Ottawa on 28 January 1985 (hereinafter "the Treaty"), Annex I of the Treaty shall be amended as set out in Attachment A and Annex IV shall be amended by the addition of a new Chapter 8, as set out in Attachment B.

2. The following Articles of the Treaty shall not apply in relation to Annex IV, Chapter 8:

3. Further, with regard to Article XII of the Treaty, for matters related to the Yukon River, the Yukon River Panel shall substitute for the Commission.

4. A Yukon River Salmon Restoration and Enhancement Fund ("the Fund") shall be established in accordance with the terms and conditions set out in Attachment C.

5. The obligations under this Agreement shall be subject to the obtaining of specific legislative authority from the United States Congress for the Fund. Such Congressional action (i.e., authorization and appropriation) lies within the discretion of the U.S. Congress.

6. If in any year the United States does not make an annual contribution as required in Attachment C, until the United States makes such contribution for that year the Parties' obligations under this Agreement shall be suspended.

7. Each Government shall take the necessary steps to implement the obligations under this Agreement consistent with its national laws.

8. If the Treaty is terminated in accordance with Article XV(2) thereof:

(1) this Agreement shall be suspended and enter into force under the name "Yukon River Salmon Treaty" upon an exchange of diplomatic notes indicating that the necessary

internal procedures of the Parties for the entry into force of the Yukon River Salmon Treaty have been completed;

(2) the functions of the Yukon River Panel shall be assumed by a new commission, the "Yukon River Salmon Commission", and the Yukon River Panel shall thereupon cease to exist;

(3) other provisions of the Treaty, to the extent they apply to the Yukon River, shall remain in effect as part of the Yukon River Salmon Treaty, mutatis mutandis; and

(4) our two Governments shall seek to agree on other measures necessary for the continuation and application of the Yukon River Salmon Treaty.

9. At the end of the third year following its entry into force, and at any time thereafter, either Government may give notice of its intention to terminate this Agreement. The Agreement shall terminate one year following such notification.

If the above proposal is acceptable to the Government of the United States of America, I have the honour to propose that this Note, with its attachments, which shall be equally authentic in English and French, and your Excellency's affirmative Note in reply shall constitute an Agreement between our two Governments which shall enter into force on the date of your Note in reply.

Accept, Excellency, the renewed assurances of my highest consideration.

Robert Thibault
Minister, Fisheries and Oceans

ATTACHMENT A

Amendment to Annex I of the Pacific Salmon Treaty

The Parties agree to add a new paragraph (e) as follows:

"(e) a Yukon River Panel for salmon originating in the Yukon River."

ATTACHMENT B

Amendment to Annex IV of the Pacific Salmon Treaty

The Parties agree to add a new Chapter 8 as follows:

Chapter 8

Yukon River

1. The Parties recognize:

(1) the uniqueness of the Yukon River and its salmon fisheries; having as their principal goal to rebuild and conserve stocks and provide benefits to the fisheries of both countries on this river system, which means the maintenance in both countries of viable fisheries on the Yukon River;

(2) that subsistence fisheries in Alaska have priority over other fisheries in Alaska;

(3) that aboriginal fisheries in Yukon have priority over other fisheries in Yukon;

(4) that salmon stocks originating from the Yukon River in Canada are harvested by fishers of both Canada and the United States and that effective conservation and management of these resources are of mutual interest; and

(5) that considerable work remains to be done to understand the composition of stocks in the various Yukon River fisheries and to develop effective management techniques based on precautionary management approaches.

Definitions

2. For the purpose of this Chapter,

(1) "Enhancement" means expanding a wild salmon stock beyond its natural production level;

(2) "Mainstem Yukon River in Canada" means the Yukon River drainage in Canada, excluding the Porcupine River drainage;

(3) "Restoration" means returning a wild salmon stock to its natural production level;

(4) "Yukon" means the Yukon Territory of Canada;

(5) "Yukon River" means the entire Yukon River drainage in Canada and the United States;

(6) "Yukon River in Canada" means the entire Yukon River drainage in Canada, including the Porcupine River drainage; and

(7) "Total Allowable Catch (TAC)" means the total run size of each salmon stock less the agreed spawning escapement objective for that stock.

Application

3. This Chapter applies to salmon originating in the Yukon River.

General

4. Each Party shall designate its management entity responsible for the harvest of salmon referred to in paragraph 3.

5. The Parties shall seek to ensure effective conservation and management of stocks originating in the Yukon River.

6. When a fishery is managed under a guideline harvest range regime:

(1) the United States shall manage its fishery with a view to delivering to the Alaska-Yukon border the agreed spawning objective plus the midpoint of the Canadian guideline harvest range; and

(2) Canada shall manage its fishery within its guideline harvest range with a view to achieving the agreed spawning escapement objective. In years when the number of salmon reaching the Yukon River mainstream border exceeds the upper end of the Canadian guideline harvest range plus the upper end of the agreed spawning escapement objective, Canada may, subject to paragraph 18, utilise the surplus.

7. The respective management entities shall consult closely and where possible co-ordinate pre-season management planning and in-season responses to run assessments. If it is determined in-season that pre-season management measures agreed to by the Panel are insufficient to achieve agreed spawning escapement objectives, the management entities shall consider taking further conservation measures to meet the escapement objectives.

8. The harvest sharing arrangement for Canadian-origin Mainstem Yukon River chum salmon shall be specified in Appendix 1, as amended from time to time by agreement of the Parties.

9. The harvest sharing arrangement for Canadian-origin Mainstem Yukon River chinook salmon shall be specified in Appendix 2, as amended from time to time by agreement of the Parties.

10. Subject to budgetary limitations, the Parties shall seek to implement the fisheries research and management programs recommended by the Panel on the advice of the Joint Technical Committee (JTC) for co-ordinated management of Yukon River chum and chinook salmon stocks.

11. Notwithstanding paragraph 10, each Party shall seek to implement such research and management programs as may be required to implement this Agreement.

12. The Parties shall maintain efforts to increase the in-river run of Yukon River origin salmon by reducing marine catches and by-catches of Yukon River salmon. They shall further identify, quantify and undertake efforts to reduce these catches and by-catches.

Yukon River Panel

13. Subject to the approval of the Parties, the Yukon River Panel shall make such by-laws and procedural rules for itself as may be necessary for the exercise of its functions and the conduct of its meetings.

14. The Yukon River Panel shall make recommendations to the management entities concerning the conservation and co-ordinated management of salmon originating in the Yukon River in Canada.

15. The respective management entities shall take into account the recommendations of the Yukon River Panel in the adoption of regulations, and shall ensure the enforcement of these regulations. These entities shall exchange annual fishery management plans prior to each season.

16. Based on recommendations of the Joint Technical Committee,

    (1) the Yukon River Panel may from time to time recommend spawning escapement objectives for implementation by the Parties through their management entities; and

    (2) the Yukon River Panel may revise the spawning escapement objectives for rebuilt stocks in Appendixes 1 and 2.

17. Each year the Yukon River Panel shall review the performance of the fishery management regimes of both Parties for the preceding season with a view to making recommendations to the respective management entities for improving management performance in order to achieve agreed objectives in future years.

18. For any year when a strong run is anticipated, the Yukon River Panel may recommend a spawning escapement objective greater than the agreed level.

19. If the Panel makes such a recommendation as specified in paragraph 18, the United States will endeavour, for that year, to deliver to the Canadian border on the mainstem Yukon River the number of salmon necessary to meet the spawning escapement objective recommended by the Panel, plus the agreed Canadian harvest share.

20. In any year of a strong run, the United States agrees to consider increasing the border escapement to a level greater than agreed in order to allow a higher spawning escapement for that year.

Joint Technical Committee

21. The Parties shall maintain the Yukon River Joint Technical Committee (JTC) established by paragraph C.2 of the Memorandum of Understanding regarding the Treaty, done at Ottawa 28 January 1985, which shall continue to report to the Yukon River Panel. The JTC shall meet annually or more frequently at the direction of the Yukon River Panel to, inter alia:

    (1) assemble and refine information on migratory patterns and the extent of exploitation in fisheries harvesting Yukon River origin salmon;

(2) review existing assessment techniques and investigate new ways for determining total return and escapement and make recommendations on optimum spawning escapement objectives;

(3) examine past and current management regimes and recommend how they may be better formulated to achieve escapement objectives;

(4) exchange information on existing and proposed restoration and enhancement programs, identify restoration and enhancement opportunities and evaluate the management consequences of harvests of restored or enhanced fish;

(5) develop and recommend restoration and enhancement programs to be funded by the Yukon River Salmon Restoration and Enhancement Fund;

(6) monitor and co-ordinate agreed research programs and recommend research required in order of priority to enable the Parties to effectively implement this Chapter;

(7) evaluate annually the status of Canadian origin chum and chinook salmon stocks and make recommendations for adjustments to the rebuilding programs set out in this Chapter;

(8) annually, no later than 30 April, provide the Panel with run outlooks and proposed in-season management strategies designed to achieve escapement objectives and agreed harvest shares of Canadian-origin salmon stocks;

(9) use existing procedures and investigate new ways to evaluate progress in rebuilding salmon stocks where necessary;

(10) investigate and recommend stock separation studies that would assist in developing specific fishery management programs for individual salmon stocks;

(11) review and analyse the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives;

(12) submit an annual report to the Yukon River Panel on fishery performance, including harvests and fishing effort of all user groups, fish values made available by either side and biological status of stocks;

(13) review information available on coho salmon originating in the Yukon River, and undertake assessments of such stocks;

(14) report on the condition of salmon habitat and recommend measures to be taken to protect or enhance salmon habitat;

(15) when appropriate, provide an evaluation of the ecological and genetic risks of restoration or enhancement, socio-economic impacts, and identify alternative actions including but not restricted to fishery management actions;

(16) recommend levels for restored stocks consistent with natural habitat capacity; and

(17) undertake other assignments as may be requested from time to time by the Yukon River Panel.

Rebuilding Mainstem Yukon River Chum and Chinook Stocks

22. With respect to chum and chinook salmon originating in the Yukon River in Canada, when spawning escapements fall below target levels for rebuilt stocks as specified in Appendices 1 and 2 to Chapter 8, Annex IV, upon recommendation of the Yukon River Panel, the Parties shall, through their respective management entities, implement a brood year rebuilding program for the Canadian mainstem stocks. The objective of the rebuilding plan shall be to systematically, as per paragraph 23 below, rebuild the spawning escapement in subsequent return years to the escapement objectives specified from time to time in Appendix 1 for chum and in Appendix 2 for chinook salmon.

23. The rebuilding program shall take into account the relative health of the brood years with the object of rebuilding stronger brood years in one cycle and weaker brood years in no more than three cycles in equal increments. For greater certainty, a cycle for chum salmon is typically considered to be four years, and for chinook salmon, six years, although the Panel may incorporate other age components in designing rebuilding programs.

24. Based on the recommendations of the JTC, the Yukon River Panel shall establish and modify as necessary interim escapement objectives of the rebuilding program.

Porcupine River

25. To ensure maximum benefits accrue to Porcupine River spawning escapements, the Parties shall:

(1) not initiate new fisheries on Canadian-origin stocks within the Porcupine River drainage before December 31, 2006; and

(2) following this period, any Party that intends to initiate a new fishery on the Porcupine River shall inform the Yukon River Panel, which shall recommend conservation and management measures.

26. With respect to the Fishing Branch River chum salmon, the Parties agree that when spawning escapements fall below target levels for this stock as specified in Appendix 1 to Attachment B, the Yukon River Panel shall consider the need to develop a rebuilding plan based on information and analysis from the JTC. If the Yukon River Panel decides that such a plan is needed, it shall request the JTC to prepare a range of rebuilding plan options, including allowing this stock to rebuild as a result of the rebuilding program for the Yukon River Mainstem fall chum salmon stock. The Panel shall determine which plan to recommend to the respective management entities.

27. The Parties shall, through their respective management entities, implement the rebuilding plan.

28. Following rebuilding, the Yukon River Panel may recommend catch shares for the Canadian-origin Porcupine River chum salmon stocks.

29. If sufficient information becomes available for chinook and coho salmon stocks originating in the Porcupine River in Canada, the Panel, upon recommendation of the JTC, shall develop a conservation and management program for these stocks.

Habitat

30. In light of the benefits they receive from the salmon originating in their portions of the Yukon River, the Parties agree that:

(1) salmon should be afforded unobstructed access to and from, and use of, existing migration, spawning and rearing habitats;

(2) respective water quality standards should be maintained and enforced;

(3) productive capacity of the salmon habitat on both sides of the Alaska-Yukon border should be maintained in order to achieve the objectives of this Chapter; and

(4) should access be obstructed, water quality standards be degraded or productive capacity of the salmon habitat be diminished to a degree that affects the objectives established in this Chapter, the Yukon River Panel may recommend corrective actions which may include adjustments to fishing patterns, border escapement objectives and guideline harvest ranges.

Restoration and Enhancement

31. Each Party shall assist the Yukon River Panel in developing and implementing the programs referred to in paragraph 1 of Attachment C and shall, in particular, provide essential support, as required, for programs in its portion of the Yukon River.

32. Unless the Parties jointly decide otherwise, on the basis of recommendations by the Yukon River Panel, the primary objective of:

(1) restoration and conservation programs and projects shall be to increase spawning escapements in areas requiring restoration;

(2) enhancement projects shall be to increase harvests taking into account the conservation of wild stocks.

33. Harvest shares for salmon produced by enhancement activities shall be recommended by the Yukon River Panel.

34. The Principles and Guidelines for operation of the Yukon River Restoration and Enhancement Fund are set out in Appendix 1 to Attachment C.

35. Contributions to be made by the United States to the Fund are set out in Appendix 2 to Attachment C.

APPENDIX I
TO ATTACHMENT B

Escapement Objectives for and Harvest Sharing of Canadian-Origin Chum Salmon

1. Subject to paragraph 16 of this Chapter, the Parties agree that the escapement objective for the rebuilt chum salmon stock:

   (1) in the mainstem Yukon River in Canada shall be greater than 80,000 chum salmon; and

   (2) upstream from the Fishing Branch River weir site shall be 50,000 to 120,000 chum salmon.

2. Harvest of Mainstem Yukon River chum salmon shall be shared beginning in 2001, and continuing until amended by the Parties, on the following basis:

   (1) when the Total Allowable Catch (TAC) is between zero and 120,000 chum salmon, the guideline harvest range for Canada shall be between 29% and 35% of the TAC;

   (2) when the TAC is above 120,000 chum salmon, the guideline harvest range shall be between 29% and 35% of 120,000, i.e., 34,800 and 42,000 chum salmon, plus 50% of the portion of the TAC greater than 120,000 chum salmon.

APPENDIX 2
TO ATTACHMENT B

Escapement Objective for and Harvest Sharing of Canadian-Origin Yukon River Chinook Salmon

1. Subject to paragraph 16 of this Chapter, the Parties agree that the spawning escapement objective for the rebuilt chinook salmon stock in the Mainstem Yukon River shall be 33,000 to 43,000 chinook salmon.

2. Harvest of Mainstem Yukon River chinook salmon shall be shared beginning in 2001, and continuing until amended by the Parties, on the following basis:

   (1) when the Total Allowable Catch (TAC) is between zero and 110,000 chinook salmon, the guideline harvest range for Canada shall be between 20% and 26% of the TAC;

   (2) when the TAC is above 110,000 chinook salmon, the guideline harvest range for Canada shall be between 20% and 26% of 110,000, i.e., 22,000 and 28,600 chinook salmon, plus 50% of the portion of TAC greater than 110,000 chinook salmon.

ATTACHMENT C
Restoration and Enhancement Fund

1. The Parties hereby establish the Yukon River Salmon Restoration and Enhancement Fund, hereinafter referred to as "the Fund", to be managed by the Yukon River Panel, which shall be used for the following purposes:

   (1) programs, projects and associated research and management activities on either side of the Alaska-Yukon border directed at the restoration, conservation and enhancement of Canadian origin salmon stocks;

   (2) programs and projects that are directed at developing stewardship of salmon habitat and resources and maintaining viable salmon fisheries in the Yukon River in Canada.

2. Programs, projects and activities shall be funded based on the Principles and Guidelines set out in Appendix 1 hereto.

3. Subject to the availability of appropriated funds, the United States shall, beginning in U.S. fiscal year 2002, make an annual financial contribution to the Fund, in the amount set out in Appendix 2 hereto. The United States will endeavor to make the contribution in the first quarter of each U.S. fiscal year.

4. If in any year the United States does not make an annual contribution as required in paragraph 3, this Chapter is suspended until the United States makes such contribution for that year.

5. The cost of administering the Fund shall be drawn from the Fund.

6. The Fund shall be open for additional financial contributions from any source.

7. Monies from the Fund shall be disbursed by the Yukon River Panel according to the following rules:

   (1) with regard to paragraphs 1 a) and b), the percentage in Appendix 2 hereto of annual available funds shall be disbursed on Canadian programs and projects approved by the Canadian section of the Yukon River Panel based on recommendations by the Canadian section of the JTC and found by the Yukon River Panel as a whole to be consistent with the Principles and Guidelines set out in Appendix 1 hereto; and

   (2) the balance of annual available funds shall be disbursed at the direction of the Yukon River Panel as a whole based on recommendations by the JTC as a whole.

8. Monies disbursed from the Fund shall be accounted for as directed by the Yukon River Panel.

APPENDIX 1
TO ATTACHMENT C

Principles and Guidelines for Restoration, Conservation and Enhancement Programs and Projects

Principles

1. Restoration, conservation and enhancement programs and projects shall be consistent with the protection of existing wild salmon stocks and the habitats upon which they depend.

2. Given the wild nature of the Yukon River and its salmon stocks, and the substantial risks associated with large-scale enhancement through artificial propagation, such enhancement activities are inappropriate at this time.

3. Artificial propagation shall not be used as a substitute for effective fishery regulation, stock and habitat management or protection.

Guidelines

4. The priorities for implementing programs and projects using monies disbursed from the Fund shall be in this order with regard to Attachment C, paragraph 1 a):

   (1) restoring habitat and wild stocks;

   (2) conserving habitat and wild stocks;

   (3) enhancing habitat; and

   (4) enhancing wild stocks.

5. Programs and projects using monies disbursed from the Fund with regard to Attachment C, paragraph 1 b) shall be limited to:

   (1) encouraging habitat stewardship, conservation and reclamation in activities and industries that impact salmon and their habitats.

   (2) maintaining viable salmon fisheries in the Yukon River in Canada, thus establishing incentives for the conservation and stewardship of salmon and their habitats. Funding for commercial salmon fishing and processing shall be limited to the development of infrastructure, capital equipment expenditures and, in years when no commercial processing occurs, the maintenance of processing infrastructure.

6. Programs and projects shall be evaluated by the Yukon River Panel based on a Yukon River basin wide stock rebuilding and restoration plan to be developed and updated periodically by the Panel. As an integral part of restoration, habitat conservation, and enhancement planning the Panel shall undertake careful assessment and inventory of wild stocks, their health, habitat, and life history.

7. The Yukon River Panel shall apply the most stringent of the fish genetics and fish disease policies of the management entity of either Party to restoration or enhancement programs and projects.

8. Following JTC evaluation of proposed programs and projects, each Party shall provide an opportunity for public comment and review of the proposed programs and projects, along with the JTC evaluation.

9. The Yukon River Panel shall decide which programs and projects to fund, based on these guidelines, the JTC evaluation and any public comments received.

APPENDIX 2
TO ATTACHMENT C

U.S. Contributions

1. Subject to the availability of appropriated funds, beginning in U.S. fiscal year 2002, the United States shall contribute 1.2 million USD annually to the Fund until this Appendix is amended by the Parties.

2. The percentage of annually available funds to be made available for projects referred to in paragraph 7 a) of Attachment C shall be 50% until this Appendix is amended by the Parties.

Appendix B

Appointment of Officers for 2002/2003

Effective December 1, 2002 a new slate of officers for the Pacific Salmon Commission was identified as follows:

Office	Country	Representative
Commission Chair	Can.	Dr. John Davis
Commission Vice-Chair	U.S.	Mr. Ron Allen
Fraser River Panel Chair	Can.	Mr. Wayne Saito
Fraser River Panel Vice-Chair	U.S..	Ms. Lorraine Loomis
Northern Panel Chair	Can.	Mr. David Einarson
Northern Panel Vice-Chair	U.S.	Mr. Dave Gaudet
Southern Panel Chair	U.S.	Mr. Pat Pattillo
Southern Panel Vice-Chair	Can.	Mr. Ed Lockbaum
Transboundary Panel Chair	Can.	Mr. Gord Zealand
Transboundary Panel Vice-Chair	U.S.	Mr. Andrew McGregor
Stan. Comm. on F&A - Chair	Can.	Dr. John Davis
Stan. Comm. on F&A - Vice-Chair	U.S.	Mr. Rollie Rousseau
Stan. Comm. on Scientific Cooperation - Chair	U.S.	Dr. Steve Pennoyer
Stan. Comm. on Scientific Cooperation - Vice-Chair	Can.	Dr. Laura Richards
Technical Committee on Data Sharing – Co-Chair	Can.	Mr. Mark Hamer
Technical Committee on Data Sharing – Co-Chair	U.S.	Dr. Norma Jean Sands
Fraser River Panel Technical Committee – Co-Chair	Can.	Mr. Les Jantz
Fraser River Panel Technical Committee – Co-Chair	U.S.	Mr. Michael Grayum
Northern Boundary Technical Committee – Co-Chair	Can.	Mr. David Peacock
Northern Boundary Technical Committee – Co-Chair	U.S.	Mr. Glen Oliver
Transboundary Technical Committee – Co-Chair	Can.	Mr. Sandy Johnston
Transboundary Technical Committee – Co-Chair	U.S.	Mr. Scott Kelley
Enhancement Sub-Committee of the Transboundary Technical Committee – Co-Chair	Can.	Mr. Pat Milligan
Enhancement Sub-Committee of the Transboundary Technical Committee – Co-Chair	U.S.	Mr. Ron Josephson
Joint Technical Committee on Chinook – Co-Chair	Can.	Mr. Rick McNicol
Joint Technical Committee on Chinook – Co-Chair	U.S.	Mr. Dell Simmons
Joint Technical Committee on Coho – Co-Chair	Can.	Mr. Wilf Luedke
Joint Technical Committee on Coho – Co-Chair	U.S.	Dr. Gary S. Morishima
Joint Technical Committee on Chum – Co-Chair	Can.	Mr. Leroy Hop Wo
Joint Technical Committee on Chum – Co-Chair	U.S.	Mr. Gary R. Graves
Selective Fishery Evaluation Committee – Co-Chair	Can.	Dr. Brent Hargreaves
Selective Fishery Evaluation Committee – Co-Chair	U.S.	Dr. Gary S. Morishima

Appendix C

Approved Budget FY 2003/2004

1	**INCOME**	
A.	Contribution from Canada	$1,506,442
B.	Contribution from U.S.	$1,506,442
	Sub total	$3,012,884
C.	Carry-over from 2002/2003	$77,317
D.	Interest	$15,000
E.	Other income	$0
F.	Total Income	$3,105,201
2	**EXPENDITURES**	
A.	1. Permanent Salaries and Benefits	$1,828,483
	2. Temporary Salaries and Benefits	$320,601
	3. Total Salaries and Benefits	$2,149,084
B.	Travel	$117,988
C.	Rents, Communications, Utilities	$137,291
D.	Printing and Publications	$15,800
E.	Contractual Services	$528,754
F.	Supplies and Materials	$68,899
G.	Equipment	$87,385
H.	Total Expenditures	$3,105,201
3	**BALANCE (DEFICIT)**	**$0**
4	**TEST FISHING PROGRAM**	
A.	Forecast Revenues	$1,096,650
B.	Forecast Expenditures	$1,045,442
C.	Forecast Balance	$51,208
5	**TOTAL BALANCE (DEFICIT)**	**$51,208**

Appendix D

Pacific Salmon Commission Secretariat Staff as of March 31, 2003

EXECUTIVE OFFICE

Don Kowal
Executive Secretary

Teri Tarita
Records Administrator/Librarian

Janice Bakas
Secretary

Vicki Ryall
Meeting Planner

Kathy Mulholland
IT Manager

Sandi Wadley
IT Support Specialist

FINANCE & ADMINISTRATION

Kenneth N. Medlock
Finance and Administration

Bonnie Dalziel
Accountant

Angus Mackay
Fund Coordinator

FISHERY MANAGEMENT

Mike Lapointe
Chief Biologist

Jim Gable
Head, Racial Identification Group

Jim Cave
Head, Stock Monitoring Group

Steve Latham
Project Biologist, Sockeye

Peter Cheng
Project Biologist, Acoustics

Bruce White
Project Biologist, Pinks

Ian Guthrie
Head, Biometrics

Keith Forrest
Racial Data Biologist

Yunbo Xie
Hydroacoustics Scientist

Maxine Reichardt
Senior Scale Analyst

Andrew Gray
Hydroacoustics Biologist

Julie Volk
Assistant Scale Analyst

Fiona Martens
Hydroacoustic Technician (term)

Jacqueline Boffey
Scale Lab Assistant

Christine Tovey
Test Fishing Biologist

Appendix E

Membership Lists for Standing Committees, Panels, Joint Technical Committees and other Appointments as of March 31, 2003

1. STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

Dr. John Davis (Chair)
Mr. Dave Innell
Mr. Alan Boreham

Mr. Rollie Rousseau (Vice-Chair)
Mr. W. Ron Allen
Mr. Kevin Duffy
Mr. James Heffernan
Mr. Dave Cantillon
Ms. Penny Williams

Staff

Mr. Don Kowal (ex. Officio)

Editorial Board

Mr. Tim Young

Mr. Dave Cantillon (acting)

Staff

Mr. Don Kowal (ex. Officio)

2. FRASER PANEL

Mr. Wayne Saito (Chair)
Mr. Murray Chatwin
Mr. Mike Griswold
Mr. Terry Lubzinski
Chief Ken Malloway
Mr. Larry Wick

Ms. Lorraine Loomis (Vice-Chair)
Mr. Richard Lincoln
Mr. Dave Cantillon
Mr. Robert F. Kehoe

FRASER RIVER PANEL - ALTERNATES

Mr. Brian Assu
Mr. Tom Bird
Mr. Les Rombough
Mr. Paul Ryall
Mr. Peter Sakich
Mr. Marcel Shepert

Mr. Ronald G. Charles
Mr. Jack R. Giard
Mr. Patrick Pattillo
Mr. William L. Robinson

3. SOUTHERN PANEL

Mr. Ed Lochbaum (Vice-Chair)
Mr. John Legate
Dr. Don Hall
Mr. Jeremy Maynard
Mr. Paul Rickard

Mr. Patrick Pattillo (Chair)
Mr. Terry R. Williams
Mr. Peter Dygert
Mr. James E. Harp
Mr. Larry Carpenter

SOUTHERN PANEL - ALTERNATES

Mr. Errol Sam
Mr. Barry Rosenberger
Ms. Marilyn Murphy
Mr. Bill Pirie
Mr. Stan Watterson

Mr. Keith E. Wilkinson
Mr. Richard Lincoln
Mr. Randy A. Settler
Mr. Robert Wunderlich
Mr. Andy Whitener

4. NORTHERN PANEL

Mr. Dave Einarson (Chair)
Mr. Bill DeGrief
Mr. John Murray
Mr. John McCulloch
Mr. Greg Taylor
Mr. Chris Barnes

Mr. Dave Gaudet (Vice-Chair)
Mr. William F. Auger
Mr. James E. Bacon
Mr. William Foster
Mr. William Hines
Mr. Howard Pendell

NORTHERN PANEL - ALTERNATES

Mr. John Brockley
Chief Harry Nyce Sr.
Ms. Deborah Jeffrey
Mr. Rick Haugan
Ms. Pat Moss
Mr. Bruce Shepherd

Mr. Arnold Enge
Mr. Andrew W. Ebona
Dr. Jack Helle
Mr. Dennis Longstreth
Mr. Robert M. Thorstenson
Mr. Thomas Brookover

5. TRANSBOUNDARY PANEL

Mr. Gordon Zealand (Chair)
Mr. Ronald Chambers
Mr. Stephan Jacobs
Mr. Ray Kendell
Ms. Cheri Frocklage
Mr. John Ward

Mr. Andrew McGregor (Vice-Chair)
Mr. James Becker
Mr. Andrew Ebona
Mr. Arnold Enge
Mr. William Hines
Mr. Stanley D. Malcom
Mr. Richard Davis

6. STANDING COMMITTEE ON SCIENTIFIC COOPERATION

Dr. Laura Richards (Vice-Chair)
Dr. Dick Beamish

Mr. Steve Pennoyer (Chair)
Dr. David Hankin

7. NORTHERN FUND COMMITTEE

Mr. John Lubar (Co-Chair)
Mr. Ron Fowler
Mr. Gordon Zealand

Mr. Jim Balsiger (Co-Chair)
Mr. Kevin Duffy
Mr. Jev Shelton

8. SOUTHERN FUND COMMITTEE

Mr. Ron Kadowaki (Co-Chair)
Dr. Don Hall
Mr. William Otway

Mr. Rollie Rousseau (Co-Chair)
Mr. Larry Rutter
Mr. Donald Sampson

9. JOINT TECHNICAL COMMITTEE ON CHINOOK

Dr. Rick McNicol (Co-Chair)
Dr. Gayle Brown
Mr. Wilf Luedke
Ms. Karen Mathias
Mr. Chuck Parken
Mr. Julian Sturhahn
Dr. Arlene Tompkins
Mr. Ivan Winther

Mr. Dell Simmons (Co-Chair)
Mr. David Bernard
Mr. John Carlile
Dr. John H. Clark
Mr. Gary R. Freitag
Ms. Pam Goodman
Mr. Edgar Jones
Dr. Robert Kope
Mr. Brian Lynch
Ms. Marianne McClure
Mr. Scott McPherson
Mr. Scott Marshall
Dr. Gary S. Morishima
Mr. James F. Packer
Mr. Joseph Polos
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Mr. Alex C. Wertheimer
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10. JOINT TECHNICAL COMMITTEE ON COHO

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Mr. Chuck Parken
Mr. Kent Simpson
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Mr. Joe Tadey
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12. TECHNICAL COMMITTEE ON DATA SHARING

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Ms. Lia Bijsterveld
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Mrs. Amy Seiders

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Ms. Brenda Adkins
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13. FRASER RIVER PANEL TECHNICAL COMMITTEE

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Mr. Alan Cass
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Mr. Mike Staley

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14. NORTHERN BOUNDARY TECHNICAL COMMITTEE

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Mr. Mark Potyrala
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Mr. John Wilcock
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16. TRANSBOUNDARY TECHNICAL COMMITTEE

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Mr. Troy Thynes
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Mr. Edgar Jones
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Dr. Kim Hyatt
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17. JOINT CHINOOK INTERFACE GROUP

Mr. Gerry Kristianson (Chair)
Mr. Ron Fowler
Mr. Russ Jones

Mr. Jev Shelton (Vice-Chair)
Mr. Curt Smitch
Mr. Don Sampson

18. NATIONAL CORRESPONDENTS

Mr. Alan Boreham

Mr. Dave Cantillon (acting)